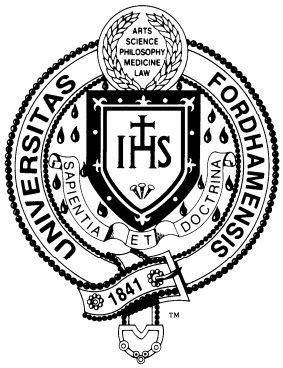

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Free Trade Agreements and External Tariffs

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Free Trade Agreements and External Tariffs

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Abstract

There has been a proliferation of preferential trade agreements within the last two decades. In this paper I analyze the effects of free trade agreements (FTAs) on external tariffs under a political economy setup. I extend the Grossman and Helpman (1995) model by determining tariff rates endogenously instead of assuming they are fixed during or after the formation of FTAs. I show that when an FTA is established, the tariff rates that apply to non-members essentially decline. More importantly, I investigate the interaction between endogenous tariff determination and the feasibility of an FTA. I find that the expectation of tariff reductions under endogenous tariffs makes an otherwise feasible FTA under fixed tariffs become infeasible. However, if domestic import-competing sectors are relatively smaller, an FTA with endogenous tariffs may be more likely to be feasible than an FTA with fixed tariffs.

JEL Classification: F13, F15.

Keywords: Free trade agreements, political economy of trade policy, trade liberalization, feasibility.

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1 Introduction

There are 283 preferential trade agreements (PTAs) in force as of 31 July 2010 (WTO 2010) with more than 200 of them established after 1990. The effect of these regional/preferential agreements on the global trade in general and whether they help or hinder multilateral trade liberalization (MTL) process is an important concern for both economists and policymakers.

In this paper I extend the Grossman and Helpman (1995) model on the politics of free trade agreements (FTAs) and examine the impact of FTAs on the external tariffs applied to non-member nations. Grossman and Helpman (1995) analyze the necessary conditions for an FTA to become an equilibrium outcome in a political economy model with perfect competition.[1] However, they assume that the external tariffs are fixed during and after the formation of FTAs. I consider the effects of FTAs on external tariffs by endogenizing the tariff formation and carefully analyze the link between the change in tariffs and feasibility of an FTA. I show that once an FTA is in place, the tariffs imposed on non-members are expected to decline.[2] However, when I endogenize the formation of FTAs, they may or may not be feasible given the possible reduction in the external most favored nation (MFN) tariffs.

This paper contributes to the debate on the effect of FTAs on multilateralism by pointing to the plausible reduction in tariffs that apply to extra-FTA countries. Yet, the main novelty of the paper is comparing feasibility of FTAs under fixed versus endogenous external tariffs. I find that a larger number of FTAs become infeasible with endogenous tariffs due to the opposition by import-competing lobbies anticipating the decline in prices. However, when

[1] Krishna (1998) investigates a similar problem to Grossman and Helpman (1995) under imperfect competition, specifically a Cournot-oligopoly model. In Grossman and Helpman (1995) governments value a weighted sum of social welfare and contributions by lobbies, whereas in Krishna (1998) the decision of the governments to form an FTA is based on firms' profits. Both papers point out that trade diverting FTAs are more likely to find support and come into existence.

[2] As will become clearer in Section 5, the main channel that leads to the reduction in external tariffs is the revenue transfer effect of the FTA where the pre-FTA tariff revenue is transferred to the FTA partner in the form of rents. With the loss of tariff revenues due to trade diversion, the balance between political contributions and social welfare in the government objective is distorted making a divergence from status quo necessary.

the import sectors are relatively smaller, the opposition is weaker and the efficiency and rental gains in the export sector may take over making an FTA more likely to be feasible under endogenous tariffs as compared to fixed external tariffs.

In the next section, I present a brief review of the related literature. In Section 3, I introduce the basic aspects of the underlying model. In Section 4, I analyze FTAs under fixed external tariffs and in Section 5, I relax the fixed tariffs assumption and consider FTAs under endogenous external tariffs. Section 6 concludes.

2 Literature Overview

In the earlier papers[3], the stumbling versus building block[4] question of PTAs has drawn considerable attention. With the ever increasing speed of newer agreements, the effects of PTAs on the Doha Round of negotiations is yet to be seen. However, for the Uruguay Round there is evidence that free trade agreements (FTAs) negotiated by the United States (Limão 2006) and the European Union (Karacaovali and Limão 2008) slowed down their multilateral tariff liberalization, whereas accession of new members to the EU had no effect. In contrast, Estevadeordal et al. (2008) find that PTAs have increased the unilateral tariff liberalization towards nonmembers in ten Latin American countries. Bohara et al. (2004) similarly find that, among the two largest members of the Mercosur trade agreement, Argentina has lowered its external tariffs in sectors where there is an increasing import penetration from Brazil.

In the theoretical literature, we have a mixed set of results in terms of the effect of PTAs on tariffs applied to nonmembers (external tariffs). Panagariya and Findlay (1996) show that for an exogenously introduced FTA, external tariffs might rise where the tariff in each sector is determined by the amount of labor employed in the lobby of that sector. Cadot et

[3] Panagariya (2000) provides an excellent survey on the preferential trade liberalization issue with a specific emphasis on theory.

[4] The terms as given in Bhagwati (1991).

al. (1999) also demonstrate that extra-union tariffs could increase in their 3 country Meade-Lipsey setup. Moreover, the protection rises with deeper integration when they consider Customs Unions (CU). Limão (2007) establishes a stumbling block effect of an FTA on multilateral trade liberalization when it involves non-trade objectives. A large member of the FTA has an incentive to keep the multilateral tariffs higher on goods imported at a duty-free preferential rate from the small union member. If it were to roll down the MFN tariffs, it would essentially eliminate the preferential agreement it values in the first place. Saggi (2006) in a three country intraindustry trade oligopoly setup finds that FTAs undermine multilateral tariff cooperation when countries are symmetric but FTAs may facilitate multilateral trade when countries are asymmetric in terms of market size or cost.

Richardson (1993) points to the possibility of reduction in external tariffs due to tariff revenue competition in a 3 country model. He uses perfectly elastic supply curves and his results rely on imports coming from one of the third countries but not both. In a subsequent paper (Richardson 1995) he also shows that without transport costs producer prices equalize across members, hence they keep undercutting each other's price like in a Bertrand game where tariffs go all the way down to zero. This possibility is acknowledged in Cadot et al. (1999) when there are no rules of origin or both prospective members can satisfy each other's market at world prices such that prices are equalized in both. Bagwell and Staiger (1999) indicate a tariff reducing motive named "tariff complementarity effect", where the members of an FTA are inclined to lower tariffs on the third country after removing tariffs amongst them in a non-cooperative Nash equilibrium. Bond et al. (2004) with a similar reasoning find that at constant rest of the world (ROW) tariffs, adopting an FTA reduces the tariffs below the Kemp-Wan (1976) level[5] since FTAs indicate lack of cooperation and lead to complementarity. Ornelas (2005) points that an FTA lowers the incentive of the import-competing sectors for lobbying and this "rent destruction" may reduce the viability of an FTA.

[5] The level which leaves the ROW unaffected.

Finally, this paper contributes to the literature by extending our understanding of the link between feasibility of FTAs and endogenously determined tariffs as well as the effect of FTAs on external tariffs. Furthermore, it produces new testable predictions. The presence of trade diversion and the subsequent decline in external tariffs may lower the possibility to form FTAs but a small country may be more likely to be involved in an FTA when its import-competing sector is not big as compared to potential exports and imports in the post-FTA period.

3 Basic Model

The setup is based on Grossman and Helpman (1994). On the consumption side, the individual preferences are captured by a quasilinear utility function which is linear in the numeraire good $i = 0$

$$u(c) = c_o + \sum_{i=1}^{N} u_i(c_i) \tag{1}$$

where c_i is the consumption of good i and $u_i(.)$ is an increasing and concave function. The size of the population is assumed to equal 1. The consumers are identical with the same optimal consumption $c_i = D_i(p_i)$ for goods $i = 1, \ldots, N$ and the remaining income is spent on the numeraire good $c_0 = E - \sum_{i=1}^{N} p_i D_i(p_i)$ where E denotes the total individual expenditure. Thus, the indirect utility of individuals can be expressed as

$$V(p) \equiv E - \sum_{i=1}^{N} p_i D_i(p_i) + \sum_{i=1}^{N} u_i \left(D_i(p_i)\right) = E + CS(p) \tag{2}$$

where $CS(.)$ stands for the per capita (and aggregate) consumer surplus.[6]

The numeraire good is produced with only labor, $X_0(p_0) = L_0$, whereas the other goods make use of labor and a sector specific factor, $X_i = f_i(L_i, K_i)$ for $i = 1, \ldots, N$. The domestic price of good 0 is normalized to 1, hence under the competitive factor markets assumption

[6] Please see the appendix for the derivation.

the wage rate will also be equal to 1.[7] Then, the return to the specific factor in sector i (for a given p_i) is

$$\pi_i(p_i) = \max_{L_i} [p_i f_i(L_i, K_i) - L_i] \tag{3}$$

with the optimal output defined by $X_i(p_i) = \pi_i'(p_i)$ using the envelope theorem.

$M_i(p_i) = D_i(p_i) - X_i(p_i)$ denotes import demand for good i. The international prices of all goods are assumed to be normalized to 1, hence for a protected sector the domestic price is given by $p_i = 1 + \tau_i$ where τ_i denotes both the advalorem and specific tariff rate. The total tariff revenue for the government is $TR(p) = \sum_{i=1}^{N} \tau_i M_i(p_i)$ and it is redistributed back to the public in its entirety without any wasteful government expenditures. Summing over all the individuals in the economy we obtain the aggregate social welfare as the sum of labor income, specific factor rents, tariff revenue and consumer surplus

$$W(p) = L + \sum_{i=1}^{N} \pi_i(p_i) + \sum_{i=1}^{N} \tau_i M_i(p_i) + CS(p) \tag{4}$$

where L denotes both aggregate labor supply and labor income.

For simplicity, all specific factor owners are assumed to be organized having overcome the collective action problem as discussed in Olson (1965). Each organized lobby presents a menu of contributions to the government, mapping each policy with a contribution level which follows the menu auctions problem studied by Bernheim and Whinston (1986). The objective of the factor owners is to maximize their rents net of political contributions: $\max[\pi_i(p_i) - \chi_i(p_i)]$. The assumption here is that each lobby constitutes an insignificant portion of the population, hence the government transfers and consumer surplus are not considered as part of their objective. The government, on the other hand, maximizes

$$G(p) = \sum_{i=1}^{N} \chi_i(p_i) + aW(p) \tag{5}$$

[7] We are also assuming that aggregate supply of labor is large enough to guarantee production of good 0.

where $W(.)$ is the social welfare defined in equation (4), $\chi_i(.)$ is political contributions in sector i and a represents the marginal weight government places on social welfare relative to contributions.

There are two stages in the protection game: In the first stage, lobbies offer a contribution schedule tied to respective policies by the government (the prices received by them). In the second stage, government decides about the trade policy and collects the corresponding contributions. As in Grossman and Helpman (1994) I assume a truthful Nash equilibrium based on Bernheim and Whinston (1986) such that each lobby uses a *truthful contribution schedule*

$$\chi_i(p_i) = \max[0, \pi_i(p_i) - BW_i] \tag{6}$$

where BW_i is a constant. Thus, the government objective can be re-expressed as a weighted social welfare function

$$G(p) = \sum_{i=1}^{N} [(1+a)\pi_i(p_i) - BW_i] + a\left[L + \sum_{i=1}^{N} \tau_i M_i(p_i) + CS(p)\right] \tag{7}$$

and we can obtain the optimal tariff rate for sector i by maximizing equation (7) with respect to $\boldsymbol{\tau}_i$. As derived in the appendix, the equilibrium advalorem/specific tariff rate is implicitly defined by

$$\tau_i = -\frac{X_i(\tau_i)}{aM_i'(\tau_i)} \equiv \frac{X_i(\tau_i)/M_i(\tau_i)}{a\varepsilon_i(\tau_i)} \tag{8}$$

where $\varepsilon_i(.)$ stands for the elasticity of import demand. A similar expression is obtained in various political economy models (Helpman 1997). The tariff rate for sector i is a decreasing function of the marginal weight placed on the well-being of an average voter, a, the import demand elasticity, ε_i, and the import penetration ratio, M_i/X_i. A tariff is a tax on imports so the deadweight loss created is lower the more inelastic the import demand is. In addition, a relatively larger market for imports (i.e. a lower X_i/M_i) creates a greater price distortion potential which the government avoids and the marginal benefit of a tariff is higher when

it applies to more units. Nevertheless, in the absence of lobbying, the optimal tariff rate is zero.

4 FTAs with Fixed External Tariffs

We will consider a free trade agreement (FTA) between two countries that knocks their bilateral tariffs on all products down to zero while keeping their trade policy against non-members independent. In this section, I assume that the external MFN tariffs do not change after the FTA is formed from their pre-FTA levels as in Grossman and Helpman (1995) and then relax this assumption in the next section by endogenizing the formation of tariffs. I would like to focus on viable free trade areas, since the goal is eventually to analyze the tariff levels when an FTA is actually formed. It has been noted that trade diverting preferential agreements are more likely to find political support (e.g. Krishna 1998) and be feasible (e.g. Grossman and Helpman 1995). A setup with trade diversion enables mobilization of potential exporters to lobby for the FTA and reduces the chance of an FTA getting blocked by import-competing lobbies.

An FTA is considered to be feasible for a country if the total gain as measured by the weighted sum of lobby gains and aggregate social welfare gain exceeds the total loss of forming an FTA:

$$\sum_{i=1}^{N} \pi_{i,fta}(.) + aW_{fta} \geq \sum_{i=1}^{N} \pi_{i,nofta}(.) + aW_{nofta} \tag{9}$$

This condition is basically derived from equation (7), where the government objective is to maximize a weighted sum of social welfare and political contributions which are directly linked to the well-being of organized specific factor owners. Thus, we rule out the case where the FTA decision gets blocked by losing lobbies, or the government itself.

If an FTA is deemed to be feasible for each prospective member as outlined in equation

(9), then an FTA will be established in equilibrium. Therefore, not only the tariff rates are determined politically under the influence of special interests but the decision to form an FTA is part of the same political process as well.

There are 2 prospective FTA partners, Home (H) and Foreign (F), where country F variables are denoted with an asterisk. Without loss of generality, I assume that a fraction "s" of the sectors have a greater supply than the rest, which in return constitute a "$(1-s)$" share of all sectors in H; whereas, country F sectors are modeled as the exact mirror images of country H sectors. We know from equation (8) that the tariffs will be higher for sectors with greater supply. Thus, for a fraction "s" of the sectors H is the potential importer, whereas for a fraction "$(1-s)$" of the sectors F is the potential importer, after the FTA is formed. The sectors will be referred to as "Import Sector"s or "Export Sector"s accordingly. An import sector has a specific meaning in this framework indicating that a country will start to import in this sector from its partner only after the FTA is established. This should not be confused with the fact that every sector is essentially import-competing prior to the FTA. Similarly, a country will start exporting to the FTA partner in an export sector only after the FTA is established while it will continue to import from rest of the world.

Let us follow Grossman and Helpman (1995) in parameterizing the problem at hand for our results in the next section to be comparable. Thus, we assume inelastic supply curves such that $X_i = X_k^* = \theta X$ and $X_k = X_i^* = (1-\theta)X$ with $\theta > 1/2$, for representative sectors i and k. In country H, sector i is the import sector and sector k is the export sector and it is vice versa in country F. Demand curves are linear in the following form for all sectors $j = 1, ..., N$ in H and F: $D_j(.) = D_j^*(.) = D - bp_j$, with $b > 0$, $D > 0$. Figure 1 depicts the case of import sector i where H has a higher pre-FTA equilibrium tariff rate than F due to higher supply in H

$$\tau_i = \frac{\theta X}{ab} > \tau_i^* = \frac{(1-\theta)X}{ab} \tag{10}$$

This setup ensures that there will be trade diversion from H to F in import sector i after

the FTA is established. The supply in country F (H) is not enough to cover the import demand of country H (F) at the equilibrium tariff rate in import sector i (k) which requires the following parameter restriction by assumption[8]

$$\frac{D-b}{X} > 1 + \frac{\theta}{a} \tag{11}$$

Referring to Figure 1, H initially imports Q_1 units in sector i from rest of the world but diverts $(1-\theta)X$ ($< Q_1$) units to F after the FTA. In H, the consumer and producer prices in sector i remain at $p_i = 1+\tau_i$ and in F, consumer prices stay at $p_i^* = 1+\tau_i^*$ after the FTA, where τ_i and τ_i^* are defined by equation (10). Producers of country F enjoy the higher price of $p_i (> p_i^*)$ by exporting to H. Consumer surplus does not change in sector i for both H and F. Specific factor returns are unaffected from the FTA in H and they naturally increase in F. The tariff revenue in H from sector i is reduced as measured by region T_1 in Figure 1.

[FIGURE 1 ABOUT HERE]

Figure 2 depicts the case of export sector k where F has a higher equilibrium tariff rate than H due to higher supply in F. After the FTA, country H's total production in sector k is exported to F to take advantage of the higher prices in F. Referring to Figure 2, imports of H from rest of the world increases from Q_3 to Q_4 units in sector k replacing the domestic production lost to exports, and hence tariff revenue increases as measured by region T_6.

[FIGURE 2 ABOUT HERE]

Applying equation (9), an FTA will be feasible for the following parameter values for a country with a fraction "s" of import sectors, as derived in the appendix,

$$s \leq \frac{1}{1 + \frac{a\theta}{a\theta+(2\theta-1)}} \tag{12}$$

[8]The parameter restriction is to ensure that $X_i^*(X_k)$ crosses $M_i(M_k^*)$ at a price level above $p_i(p_k^*)$.

Given that θ is greater than 0.5 by definition, the term on right hand side of equation (12) exceeds 0.5. This indicates that for a relatively equal number of import and export sectors, an FTA will always be feasible for the two nations and come into existence.

5 FTAs with Endogenous External Tariffs

In this section, unlike Grossman and Helpman (1995), we relax the assumption that external tariffs are fixed at their pre-FTA levels. When an FTA is established, it is realistic to believe that MFN tariffs on non-members will still be obtained politically through the political contributions game described in Section 3. Using otherwise the same parameterization and setup in the previous section, the pre-FTA equilibrium tariffs for a representative sector i in H and F are defined by equation (10).

In the import sectors, the objective of the lobbies essentially remains to be the same, which results in identical contribution schedules relating to trade policies as before. Nevertheless, the social welfare will be affected from the fact that there will be no more tariff revenue coming from the imports diverted to the FTA partner. This additional negative channel of "revenue transfer" in the social welfare will incite the government to counteract it by implementing lower extra-FTA tariffs which increases consumer surplus and creates new trade while making the government content with lower contributions from the import-competing lobbies.

Once the FTA is formed, the tariff revenue in import sector i becomes

$$TR_i^{fta} = \tau_i[D_i(p_i) - X_i(p_i) - X_i^*(p_i)] \tag{13}$$

Revising the government objective function (equation (7)) with this new tariff revenue expression, the post-FTA external tariffs in an import sector will be implicitly determined by

the following equation, as derived in the appendix,

$$\tau_i^{fta} = -\frac{[X_i(\tau_i) - aX_i^*(\tau_i)]}{a[M_i'(\tau_i) - X_i^{*\prime}(\tau_i)]} \tag{14}$$

In the export sectors, the domestic trade policy becomes irrelevant, since exporters can enjoy higher protection in the partner country and they choose to supply solely to the partner's market. Therefore, the motive for providing contributions is no more present if there exists an FTA in place. In the absence of contributions, the government is essentially maximizing the social welfare only and does not indicate any extra fondness to the producers. As a result, the corresponding optimal level of external tariffs for the small countries considered is equal to zero for the export sectors.[9]

Using the same parameterization in the previous section, post-FTA external tariffs take the following form

$$\tau_i^{fta} = \frac{\theta X - a(1-\theta)X}{ab} < \tau_i = \frac{\theta X}{ab} \text{ and } \tau_i^{*fta} = 0 \tag{15}$$

For this FTA to be feasible, at the very least we must have post-FTA external tariffs in the import sector higher than partner's pre-FTA external tariffs, i.e. $\tau_i^{fta} > \tau_i^*$. This way, exporters will be mobilized in support of the FTA while the import-competing sectors lose. This requires the following additional parameter restriction by assumption

$$\frac{\theta}{(1-\theta)} > 1 + a \tag{16}$$

Referring to Figure 1, before the FTA, H imports Q_1 units from rest of the world and none from F in sector i. After the FTA, H diverts $(1-\theta)X$ units to F and imports $[Q_2 - (1-\theta)X]$ units from rest of the world. Therefore, total imports increase by $Q_2 - Q_1$ units. In this case, there is naturally both trade creation and trade diversion. In H, the consumer and producer

[9] Cadot et al. (1999) find a similar result under a 3 country à la Meade setup.

prices in sector i decrease to $p_i^{fta} = 1 + \tau_i^{fta}$ and in F, consumer prices fall to $p_i^{*fta} = 1$ after the FTA, where τ_i^{fta} is defined by equation (15). Producers of country F enjoy the higher price of $p_i^{fta} (> p_i^*)$ by exporting to H. Consumer surplus improves in sector i for both H and F. Specific factor returns decrease in H and they increase in F. The tariff revenue in H for sector i is reduced as measured by regions $[T_4 - T_1 - T_2]$ in Figure 1.

In sector k, similarly, country H exports all of its production to F due to higher prices there after the FTA. This time, specific factor returns decrease in F while they increase in H. Referring to Figure 2, imports of H from rest of the world increases from Q_3 to Q_5 units in sector k replacing the domestic production channeled to exports. Since it is not necessary to lobby for import tariffs at this point, they are removed, and hence tariff revenue decreases as measured by region T_5. Consumer surplus improves in sector k for both H and F. Finally, applying equation (9), an FTA will be feasible for the following parameter values for a country with a fraction "s" of import sectors, as derived in the appendix,

$$s \leq \frac{\frac{1}{2a}(3\theta - 1) - 1 + 2\theta + a(\theta - 1)}{\frac{1}{2a}(3\theta - 1) - 1 + 3\theta + a(5\theta/2 - 3/2)} \tag{17}$$

In order for an FTA to be endorsed by the two nations, equation (9) needs to be satisfied for both of them. This will only occur when import sector fractions in both countries ("s" for H and "$(1 - s)$" for F) are below the upper bounds provided in equation (12) for fixed external tariffs and equation (17) for endogenous external tariffs. Thus, for an FTA to be feasible for the two nations and come into force, we need

$$(1 - upper\_bound) \leq s \leq (upper\_bound) \tag{18}$$

In the fixed external tariffs case, the upper bound for import sector fractions is always greater than 0.5 (see equation (12)) irregardless of parameter values as discussed. Therefore, an FTA will be feasible for both nations for a relatively equal number of export and import

sectors. For example, if the upper bound is 0.6, an FTA will be feasible for the two nations provided $0.4 \leq s \leq 0.6$, etc.

However, in the case of endogenous tariffs, for certain parameter values the upper bound falls below 0.5 which violates equation (18) rendering an FTA infeasible. For example, assuming the parameter restriction in equation (16) holds with $a = [\theta/(1-\theta)] - 0.9$, we can graph the upper bounds under fixed and endogenous tariffs for different θ (i.e. relative size of domestic production in the import sector as compared to export sector) as illustrated in Figure 3[10]. In this case, an FTA will be infeasible under endogenous tariffs whenever $\theta > 0.6$ as the upper bound falls below 0.5 violating equation (18) and making it impossible for the agreement to be ratified by both nations. Therefore, when external tariffs are endogenized and decline as opposed to remaining fixed, an FTA becomes more likely to be infeasible. For a higher θ we have two forces working against the feasibility of an FTA under endogenous tariffs: 1) a stronger import sector (relative to export sector) which will oppose the prospects of an FTA due to anticipated decline in domestic prices; and 2) a weaker export sector (relative to import sector) that stands to gain relatively little as compared to losses of the import sector.

[FIGURE 3 ABOUT HERE]

One interesting observation from Figure 3 is that we have a less restrictive upper bound under endogenous tariffs as compared to fixed tariffs when $\theta < 0.57$. Under endogenous tariffs, for a low θ, the opposition to an FTA by the import sector is weaker, whereas export sector rents become more pronounced. Therefore, a greater number of import sectors relative to export sectors (i.e. a higher "s") can be tolerated keeping an FTA feasible under endogenous tariffs as compared to fixed tariffs.

If we do the same exercise keeping one of the two parameters fixed at a time, we see that feasibility decreases in "a" and increases in "θ" under both fixed and endogenous tar-

[10] The graph is similar for setting equation (16) hold for smaller values of a as well.

iffs. On the one hand, a larger "θ" indicates a smaller export sector production relative to import-competing sector but also less reduction in welfare from trade diversion and hence a stronger overall preference for an FTA. On the other hand, a lower "a" indicates a greater weight attributed to lobbies relative to social welfare where benefits to exporters more easily outweigh the loss in social welfare, which makes FTAs more feasible.

Finally, as long as the parameter restriction in equation (16) holds, we still observe a less restrictive upper bound under endogenous tariffs as compared to fixed tariffs for a low θ. However, if equation (16) does not hold in the first place, the prospects of the reduction in tariffs make an otherwise feasible FTA become infeasible when tariffs are endogenized.

6 Concluding Remarks

In a political economy setup where organized lobbies not only influence the determination of tariff rates but also actively get involved in lobbying for or against a free trade agreement (FTA), I find that once an FTA is established, external tariffs are bound to decline. However, when we take into account the anticipated impact of the decline in tariffs, the decision to form an FTA will be affected from this anticipation in the first place. Grossman and Helpman (1995) assume away the possible change in external tariffs and show the conditions for feasibility of an FTA. When I relax the assumption of fixed tariffs and endogenize the tariff formation, I find that a greater number of FTAs will be deemed to be infeasible due to the loss of the import-competing sectors by the decline in tariffs. Nevertheless, if the size of the import sectors are relatively smaller, an FTA may be more likely to be feasible under endogenous tariffs than under fixed tariffs. This is because a smaller import sector will be less able to lobby against an FTA and with a larger export sector the efficiency gains and export sector rents will be more significant which increases the support for an FTA.

Although FTAs may lead to a decline in external tariffs, when the decision to form FTAs are politicized the feasibility of FTAs become endangered. Therefore, as a natural extension

to this paper, it would be interesting to comparatively analyze countries that sign into various preferential agreements versus those that stay out of them and how such a difference can be linked to size and political importance of import-competing sectors in the countries.

A Appendix

Equation (2)

The first order conditions from maximizing $\mathcal{L} = u(c) + \lambda(E - \sum_{i=1}^{N} p_i c_i)$ for an interior solution indicates $\lambda = 1$ and $u_i'(c_i) = \lambda p_i$. Thus, $p_i = u_i'(D_i(p_i))$ and given the population size of 1 and $u_i(c_i = 0) = 0$, the aggregate consumer surplus can be defined as

$$CS(p) = \sum_{i=1}^{N} [\int_{c_i=0}^{c_i=D_i(p_i)} p_i dc_i - p_i D_i(p_i)] = \sum_{i=1}^{N} \left[u_i\left(D_i(p_i)\right) - p_i D_i(p_i)\right] \tag{19}$$

Equation (8)

We maximize equation (7) with respect to τ_i to obtain the following first order condition for an interior solution

$$\begin{aligned} \frac{\partial G(p)}{\partial \tau_i} &= (1+a)X_i(\tau_i) + a\left[M_i(\tau_i) + \tau_i M_i'(\tau_i) - D_i(\tau_i)\right] \\ &= X_i(\tau_i) + a\tau_i M_i'(\tau_i) \end{aligned} \tag{20}$$

Equating to zero and solving for τ_i yields the first expression in equation (8). In order to obtain the second expression in equation (8), we divide both sides of the first expression by $p_i^w = 1$ and use the following elasticity definition $\varepsilon_i \equiv -M_i' p_i^w / M_i$.

Equation (12)

Equation (9) can be re-expressed as:

$$(1+a)\left[Ns\Delta\pi_i + N(1-s)\Delta\pi_k\right] + a\left[Ns(\Delta CS_i + \Delta TR_i) + N(1-s)(\Delta CS_k + \Delta TR_k)\right] \geqslant 0 \tag{21}$$

With no change in consumer prices, $\Delta CS_i = \Delta CS_k = 0$ for import sector i and export sector k. Note that under the perfectly inelastic supply curves, change in specific factor returns for a sector j is measured by $\Delta\pi_j = X_j \Delta p_j$. Here, import-competing sector i is unaffected,

$\Delta\pi_i = 0$, while export sector k gains:

$$\Delta\pi_k = (1-\theta)X\left[\frac{\theta X-(1-\theta)X}{ab}\right] = \frac{(1-\theta)(2\theta-1)X^2}{ab} \tag{22}$$

Tariff revenue in import sector i is reduced with transfer to the partner due to trade diversion, whereas tariff revenue in export sector k rises with the rise in imports from rest of the world:

$$\Delta TR_i = = -(\tau_i)(X_i^*) = -\left[\frac{\theta X}{ab}\right][(1-\theta)X] = -\frac{(1-\theta)\theta X^2}{ab} \tag{23}$$

$$\Delta TR_k = (\tau_k)(X_k) = \left[\frac{(1-\theta)X}{ab}\right][(1-\theta)X] = \frac{(1-\theta)^2X^2}{ab} \tag{24}$$

Plugging these in equation (21), gives the feasibility condition in equation (12)

$$s \leq \frac{2\theta-1+a\theta}{2\theta-1+2a\theta} = \frac{1}{1+\frac{a\theta}{a\theta+(2\theta-1)}} \tag{25}$$

Equation (14)

We maximize equation (7) with respect to τ_i replacing the tariff revenue expression with the one in equation (13) to obtain the following first order condition for an interior solution

$$\begin{aligned}\frac{\partial G(p)}{\partial \tau_i} &= (1+a)X_i(\tau_i) + a\left[M_i(\tau_i) - X_i^*(p_i) + \tau_i(M_i'(\tau_i) - X_i^{*\prime}(p_i)) - D_i(\tau_i)\right] \\ &= X_i(\tau_i) - aX_i^*(p_i) + a\tau_i[M_i'(\tau_i) - X_i^{*\prime}(p_i)]\end{aligned} \tag{26}$$

Equating to zero and solving for τ_i, we arrive at equation (14). By construction, this is a positive tariff rate leading to trade diversion so we are essentially assuming that "a" is sufficiently small such that $X_i > aX_i^*$. This indicates that the government places a reasonably relevant weight on the well-being of lobbies in proportion to the average voter.

Equation (17)

With the linear demand assumption $D_j = D_j^* = D - bp_j$ and the fact that $p_j = u_j'(D_j(p_j))$

we are in effect assuming a quadratic utility function such that

$$u_j\left(D_j(p_j)\right) = \frac{D}{b}D_j(.) - \frac{D_j(.)^2}{2b} \tag{27}$$

Plugging equation (27) in equation (19) we obtain $\Delta CS_j = \frac{b\Delta p_j^2}{2} - D\Delta p_j$. In import sector i, the consumer and producer prices go down from $p_i = 1 + \frac{\theta X}{ab}$ to $p_i^{fta} = 1 + \frac{\theta X - a(1-\theta)X}{ab}$ improving the consumer surplus and decreasing the specific factor returns

$$\begin{aligned}
\Delta CS_i &= \frac{b}{2}\left[\left(1 + \frac{\theta X - a(1-\theta)X}{ab}\right)^2 - \left(1 + \frac{\theta X}{ab}\right)^2\right] + \frac{D(1-\theta)X}{b} \\
&= \frac{(1-\theta)X}{b}\left(D + \frac{(1-\theta)X}{2} - \frac{\theta X}{a} - b\right) \qquad (28) \\
\Delta\pi_i &= \theta X\left[\frac{\theta X - a(1-\theta)X}{ab} - \frac{\theta X}{ab}\right] = -\frac{\theta(1-\theta)X^2}{b} \qquad (29)
\end{aligned}$$

In export sector k, the consumer price goes down from $p_k = 1 + \frac{(1-\theta)X}{ab}$ to $p_k^{fta} = 1$ improving the consumer surplus, while the producer price increases from p_k to $p_k^{*fta} = 1 + \frac{\theta X - a(1-\theta)X}{ab}$ raising the specific factor returns

$$\begin{aligned}
\Delta CS_k &= \frac{b}{2}\left[1 - \left(1 + \frac{(1-\theta)X}{ab}\right)^2\right] + \frac{D(1-\theta)X}{ab} \\
&= \frac{(1-\theta)X}{ab}\left(D - b - \frac{(1-\theta)X}{2a}\right) \qquad (30) \\
\Delta\pi_k &= (1-\theta)X\left[\frac{\theta X - (a+1)(1-\theta)X}{ab}\right] = \frac{(1-\theta)X^2}{ab}\left(2\theta - a(1-\theta) - 1\right) \qquad (31)
\end{aligned}$$

Tariff revenue in import sector i is reduced with transfer to the partner due to trade diversion but positively affected from the trade created due to lower prices:

$$\Delta TR_i = -(\tau_i)(X_i^*) - (\tau_i - \tau_i^{fta})(Q_1 - X_i^*) + \tau_i^{fta}(Q_2 - Q_1) = \frac{(1-\theta)X}{b}\left(b - D + \frac{\theta X}{a}\right) \tag{32}$$

In export sector k, tariffs are removed reducing the tariff revenue by

$$\Delta TR_k = -(\tau_k)(Q_3) = \frac{(1-\theta)X}{ab}\left(b - D + (1-\theta)X(\frac{1}{a}+1)\right) \tag{33}$$

Plugging these in equation (21), gives

$$\left\{\left[\frac{3\theta}{2a} - \frac{1}{2a} + 2\theta - a + a\theta - 1\right] + s\left[-\frac{3\theta}{2a} + \frac{1}{2a} - 3\theta + \frac{3a}{2} - \frac{5a\theta}{2} + 1\right]\right\} \geq 0 \tag{34}$$

which is equivalent to the feasibility condition in equation (17).

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FIGURE 1: Import Sector

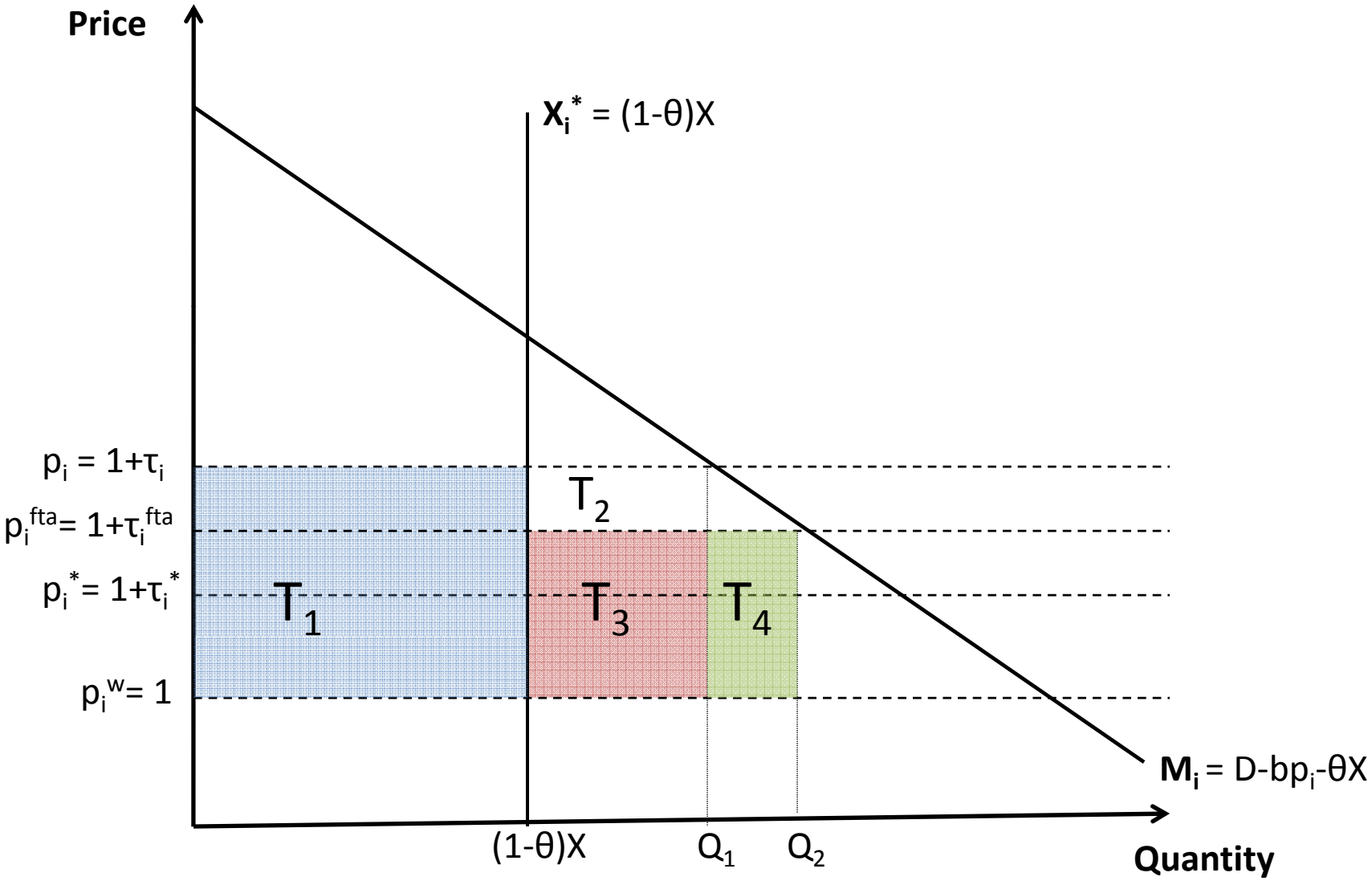

FIGURE 2: Export Sector

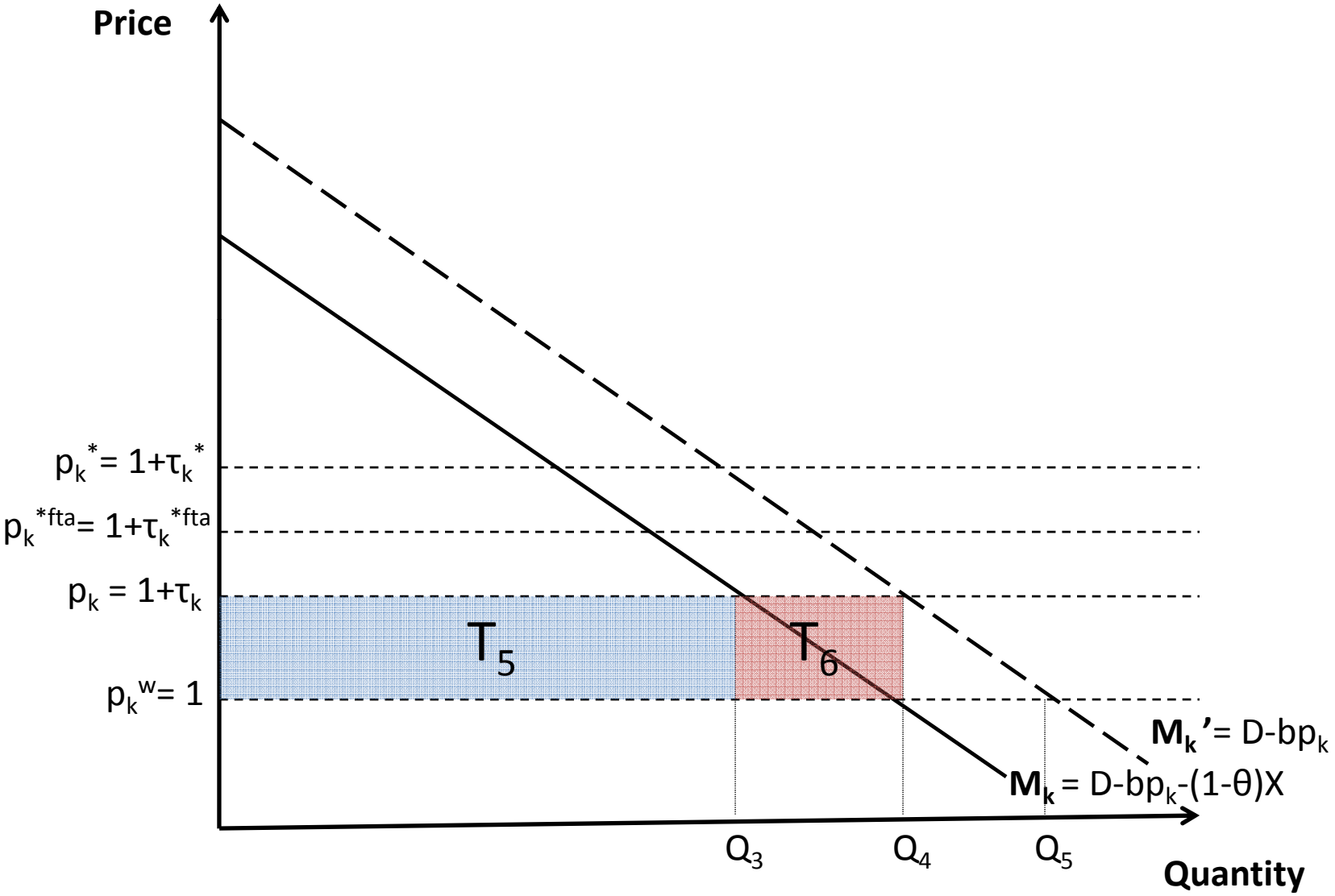

FIGURE 3: Feasibility of FTAs