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Trade-Diverting Free Trade Agreements, External Tariffs, and Feasibility

By

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Abstract

There has been a proliferation of preferential trade agreements within the last two decades. This paper analyzes the effects of free trade agreements (FTAs) on external tariffs in small economies where protection decisions are made politically. It extends the Grossman and Helpman (1995) model by determining tariff rates endogenously instead of assuming they are fixed during or after the formation of FTAs. We show that when an FTA is established, the tariff rates that apply to non-members essentially decline. More importantly, we investigate the interaction between endogenous tariff determination and the feasibility of an FTA. We find that the expectation of tariff reductions under endogenous tariffs could make an otherwise feasible FTA if tariffs were fixed become infeasible. However, if domestic import-competing sectors are relatively smaller and the government places a significant weight on political contributions relative to social welfare, an FTA with endogenous tariffs may be more likely to be feasible than an FTA assumed to fix external 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 379 preferential trade agreements (PTAs)[1] in force as of July 2013 (WTO 2013) with a majority of them established in the last two decades at an increasing pace. 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.[2]

This paper extends the Grossman and Helpman (1995) model on the politics of free trade agreements (FTAs) and examines the impact of FTAs on the external tariffs applied to non-member nations by small open economies. Grossman and Helpman (1995) analyze the necessary conditions for an FTA to become an equilibrium outcome in a political economy model with perfect competition.[3] However, they assume that the external tariffs are fixed during and after the formation of FTAs. Here, we 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.

We show that once an FTA is in place, the tariffs imposed on non-members are expected to decline. 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

[1] PTAs encompass both customs unions (CUs) and free trade agreements (FTAs). Although PTAs indicate the elimination of trade barriers substantially between members, protection against nonmembers remain due Article XXIV of the GATT/WTO. The main difference between CUs and FTAs is that CU members have a common external tariff against nonmembers while FTA members are independent in their determination of external tariffs which will be the focus in this paper.

[2] The effects of PTAs on the current Doha Round of WTO 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.

[3] 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 as we will discuss.

in the form of exporter rents. As will become clearer once we introduce the model, the loss of tariff revenue due to trade diversion distorts the balance between political contributions and social welfare in the government objective making a divergence from status quo external tariffs necessary. Therefore, 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 on a *unilateral* basis.[4] In the literature, we have a mixed set of results in terms of the effect of PTAs on tariffs applied to nonmembers (external tariffs). As reviewed excellently in Panagariya (2000) and more recently in Freund and Ornelas (2010), some papers find external tariffs rising while others find them decreasing after the formation of an FTA. For example, 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 al. (1999) also demonstrate that extra-union tariffs could increase in their 3 country setup. Limão (2007) establishes a stumbling block effect of an FTA on multilateral trade liberalization when it involves non-trade objectives. Tovar (2013) emphasizes loss aversion in individual preferences as a channel to increase external tariffs. Saggi (2006) in a three country intra-industry trade oligopoly model 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, 1995) points to the possibility of reduction in external tariffs due to tariff revenue competition. 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 adopting an FTA reduces tariffs. Finally, Ornelas (2005a,b) obtains the tariff reducing effect of FTAs under both perfectly competitive and oligopolistic markets for large countries.

[4] Because we are assuming a small country setup, the effect is a unilateral change in external tariffs, hence we abstract from direct multilateral effects that would come about in the presence of large countries.

The main contribution of this paper is in comparing feasibility of FTAs under the assumption of fixed external tariffs versus endogenously determined ones. We find that a larger number of FTAs turn out to be infeasible when external tariffs are endogenously determined as opposed to assuming them to be fixed at pre-FTA levels due to the opposition by import-competing lobbies anticipating the decline in prices. To the best of our knowledge, this result is recognized by Ornelas (2005a, 2005b) only who identifies a "rent destruction" effect of the FTAs which reduces the lobbying incentives for higher external tariffs by decreasing the lobbying rents from protection in a large country setup. He indicates that rent destruction significantly weakens the feasibility of FTAs that are welfare-reducing and although it weakens welfare-improving ones as well, these are more likely to remain feasible in the end. Unlike Ornelas (2005a, 2005b), we show that under trade-diverting (hence, presumably welfare-reducing) FTAs, there are conditions where endogenizing external tariff determination actually expands the feasibility of FTAs as compared to the case where they are assumed to be fixed (i.e. as in Grossman and Helpman 1995 and Krishna 1998). We find that when the import sectors are relatively smaller and the government weight on the contributions, hence well-being of lobbies (domestic producers), is stronger, an FTA is more likely to be feasible under endogenous tariffs. As will be discussed in detail, a relatively smaller import sector provides a setup where there are insignificant changes in lobby welfare after the FTA is formed and the main distinguishing factor for endogenous tariffs is then the increase in consumer surplus and a smaller reduction in tariff revenue as compared to fixed tariffs assumption once the external tariffs decline. Apart from this interesting and novel finding, we provide a tractable analysis and illustration of the differences in feasibility of FTAs under the two tariff rules lending further insight to one of the most important recent phenomenons in international trade.

The rest of the paper is organized as follows. In the next section, we describe the basic aspects of the underlying political economy model of tariff determination for a small open economy. In Section 3, we introduce the political economy of FTAs and the conditions for

them to be feasible. We first analyze FTAs under the assumption of fixed external tariffs and then consider FTAs under endogenous external tariffs while tracking changes in the well-being of all stakeholders. In Section 4, we compare feasibility under fixed versus endogenous tariffs assumptions and provide further discussion. Section 5 concludes.

2 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 $i = 1, \ldots, N$, where $D_i(.)$ is the demand and p_i is the price of good i. 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.[5]

The numeraire good is produced with labor only, $X_0(p_0) = L_0$, whereas the other goods make use of labor and a sector specific factor in production, $X_i = f_i(L_i, K_i)$ for $i = 1, \ldots, N$.[6] The domestic price of good 0 is normalized to 1, hence under the competitive factor markets assumption the wage rate will also be equal to 1.[7] Then, the return to the specific factor in

[5] Please see the appendix for the derivation.

[6] $f_i(.)$ is assumed to be homogeneous of degree one, hence it represents a constant-returns-to-scale production process with two factors.

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

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. We assume that the country is small, that is, it cannot affect world prices, and the international prices of all goods are normalized to 1. Therefore, 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. Aggregating 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, $\chi_i(p_i)$: $\max[\pi_i(p_i) - \chi_i(p_i)]$. 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

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

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) we 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 for

this small economy is zero.[8]

3 Free Trade Agreements

We will consider a free trade agreement (FTA) between two countries that are *small* vis-à-vis rest of the world. According to the FTA, the two countries knock their bilateral tariffs on all products down to zero while they keep their trade policy against non-members independent.

There are 2 prospective FTA partners, Home (H) and Foreign (F), where country F variables are denoted with an asterisk. Without loss of generality, we 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 while for a fraction "$(1-s)$" of the sectors F is the potential importer (from its FTA partner), 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.

3.1 Feasibility of an FTA

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

[8] If we were to assume a large country case, the optimal tariffs would be positive even in the absence of lobbying due to terms of trade considerations.

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.

It has been noted that trade-diverting preferential trade 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. Therefore, we will focus on trade-diverting FTAs that are a priori more likely to be feasible under the assumption of fixed external tariffs and subsequently see if the feasible set of FTAs change in any systematic way when tariffs are determined endogenously.

Let us follow Grossman and Helpman (1995) in parameterizing the problem at hand for our results 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 $1/2 < \theta < 1$ and $X > 0$, for representative sectors i and k.[9] 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

[9] Assuming regular upward sloping supply curves instead would have no bearing on our results as will become clear later in the model. Inelastic supply curve assumption basically buys us tractability in the algebra of derivations.

tariff rate than F due to higher supply in H:

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

which is obtained directly from equation (8).

[FIGURE 1 ABOUT HERE]

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[10]

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

Similarly, Figure 2 depicts the case of export sector k where F has a higher equilibrium tariff rate than H due to the higher supply in F.

[FIGURE 2 ABOUT HERE]

3.2 FTAs under Fixed External Tariffs Assumption

In this subsection, we 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 subsection by endogenizing the determination of tariffs along with the formation of FTAs.

Referring to Figure 1, H initially imports Q_1 units in sector i from rest of the world but after the FTA, H diverts $(1-\theta)X$ ($< Q_1$) units to F while its total imports are still

[10] The parameter restriction is to ensure that $X_i^*(X_k)$ crosses $M_i(M_k^*)$ at a price level above $p_i(p_k^*)$. Other exporting FTA-partner supply and importing partner import demand combinations will be discussed shortly.

Q_1 units.[11] 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 by assumption, where τ_i and τ_i^* are as defined in equation (10). Producers of country F enjoy the higher price of $p_i = 1 + \tau_i (> p_i^* = 1 + \tau_i^*)$ by exporting to H. Consumer surplus does not change in sector i for both H and F. Specific factor returns in H are unaffected from the FTA (since producer prices in H do not change) and they naturally increase in F (since producer prices increase in F by exporting to H).[12] The tariff revenue in H from sector i is reduced as measured by region T_1 in Figure 1 due to trade diversion.

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 the tariff revenue increases as measured by region T_6.

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,

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

Next, we introduce the endogenous tariffs case and then comparatively analyze the feasibility issue more in detail for both cases.

3.3 FTAs under Endogenous External Tariffs

In this subsection, 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 more

[11] That is, $Q_1 - (1 - \theta)X$ is imported from rest of the world by H in sector i after the FTA.

[12] Grossman and Helpman (1995) refer to this as the case of "enhanced protection." If the supply in country F were so large to more than cover the import demand of country H at $p_i^* = 1 + \tau_i^*$, then the sector i tariff rate in H would decline to τ_i^* after the FTA. Therefore, exporters would not gain from the FTA and with the import sectors already losing, this FTA would be infeasible which is denoted as the "reduced protection" case in Grossman and Helpman (1995). Since the goal is to see how the set of feasible FTAs will differ under endogenous tariffs as compared to fixed tariffs, this case is not considered here. We will further discuss this issue in Section 4.1.

realistic to believe that MFN tariffs on non-members will still be politically obtained through the political contributions game described in Section 2. 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).

However. 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 import sectors, the objective of the lobbies essentially remains the same, which results in contribution schedules (relating to trade policies) identical to the pre-FTA case. Nevertheless, the social welfare is affected by the fact that the tariff revenue from the imports diverted to the FTA partner is lost. This negative "revenue transfer" effect in the social welfare incites 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.

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.[13]

Using the same parameterization and setup from Section 3.1,[14] 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. Otherwise, the situation would also be prone to tariff revenue competition as described in Richardson (1995) where governments undercut each other's after-FTA tariffs in order to recover some of the lost tariff revenue from trade diversion and this would again render the FTA infeasible. 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 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

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

[14] That is, assuming equations (10) and (11) still apply here.

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,

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

4 Comparing Feasibility Sets

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 assumption and in equation (17) for endogenous external tariffs.[15] Thus, for an FTA to be feasible for the two nations and come into force, we need

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

Namely, the feasibility of an FTA under fixed tariffs assumption requires

$$\frac{a\theta}{(2\theta - 1) + 2a\theta} \leq s \leq \frac{(2\theta - 1) + a\theta}{(2\theta - 1) + 2a\theta} \tag{19}$$

[15] While we still assume equation (11) holds for both cases, i.e. we are operating under trade diversion.

which is obtained by plugging equation (12) in equation (18). And, similarly the feasibility of an FTA under endogenous tariffs requires

$$\frac{\theta + a(3\theta/2 - 1/2)}{\frac{1}{2a}(3\theta - 1) - 1 + 3\theta + a(5\theta/2 - 3/2)} \leq s \leq \frac{\frac{1}{2a}(3\theta - 1) - 1 + 2\theta + a(\theta - 1)}{\frac{1}{2a}(3\theta - 1) - 1 + 3\theta + a(5\theta/2 - 3/2)} \tag{20}$$

subject to equation (16), which can be rewritten as a lower bound restriction for θ

$$\theta > \frac{(1+a)}{(2+a)} \tag{21}$$

Figure 3 illustrates feasible sets of FTAs for different parameter configurations of s, θ, and a under fixed and endogenous tariffs assumptions.

[FIGURE 3 ABOUT HERE]

Recall that: 1) a is the marginal weight placed by the government on social welfare relative to lobbies, as defined in equation (5); 2) s is the fraction of import sectors (hence $1-s$ is the fraction of export sectors) at Home (H);[16] 3) θ is a size measure such that import-competing sectors produce θX while export sectors produce $(1-\theta)X$ units, respectively (with $1/2 < \theta < 1$ and $X > 0$).

Figure 3 comprises twelve different charts that are sorted increasing in a, with θ on the horizontal axis and s on the vertical axis. In each chart, the feasible set of FTAs under the fixed tariffs assumption (i.e. equation (19)) is depicted by the light blue region enclosed in solid lines, whereas the feasible set of FTAs under the endogenous tariffs assumption (i.e. equation (20)) is depicted by the grey region enclosed in black dashed lines. The vertical red dashed line in each chart is the lower bound restriction for θ under endogenous tariffs as defined in equation (21).

Under both fixed and endogenous tariffs, feasibility increases in θ (size of import sectors relative to export sectors) and it decreases in a (marginal weight on welfare relative to

[16] Similarly, s is the fraction of export sectors (hence $1-s$ is the fraction of import sectors) in Foreign (F).

lobbies). For a given a, a larger θ indicates a relatively smaller export sector production compared to import-competing sector,[17] hence the export sector gains are more pronounced once the FTA is formed.[18] Moreover, a larger θ also means less reduction in welfare due to trade diversion for the government to worry about. Therefore, an FTA can be supported for a wider range of s values (the fraction of import sectors) when θ is higher.

On the other hand, for a given θ, feasibility decreases in a. Given that we are operating under trade-diversion by construction, an FTA has negative social welfare effects and with a higher a, hence more weight placed on welfare, the benefit accruing to export lobbies (which directly determines their contribution level) falls short of swaying the government to enact the FTA.

Whenever $a > 0.29$, the set of parameter values which deem FTAs under endogenous tariffs feasible is smaller than the ones which assume them fixed at pre-FTA levels. This is in line with our earlier conjecture that the anticipation of reduction in tariffs after the FTA is likely to make it less likely for an FTA to be feasible due to the loss in the import-competing sectors. If the external tariffs are fixed at their pre-FTA levels, these sectors are unaffected but endogenizing tariffs leads to a decline in prices which hurts import-competing sectors and they lobby against the formation of the FTAs. Furthermore, with the decline in prices the gain in exporting sectors due to trade diversion is also less under endogenous tariffs and hence FTAs can be sustained for a smaller set of values. Indeed, for $a \geq 0.9$ FTAs under endogenous tariffs are not feasible at all while the feasible set considerably shrinks for the FTAs under fixed tariffs assumption as can be observed in Figure 3.

An interesting finding occurs for smaller values of a (the marginal weight on social welfare). While an average citizen's well-being has a weight of a in the government's objective function, the producers who make political contributions have a weight of $1 + a$. For exam-

[17] Since $1/2 < \theta < 1$ is assumed, import-competing sector is actually always larger (produces more) than the export sector.

[18] This is because the differential between export market tariff rate and the FTA partner's import sector tariff rate is larger, the greater the difference between their production levels as can be observed in equations (10) and (15).

ple, $a = 0.1$ would mean that producers are valued 11 times higher than average citizens by the government. When $a < 0.29$, there are parameter values for which an FTA under endogenous tariffs is feasible while one under fixed tariffs assumption is not. And for even smaller values of a (e.g. $a \leq 0.1$), the feasibility set is actually larger under endogenous tariffs. In this case, a wider range of values for s is supported under endogenous tariffs for feasibility when θ is relatively smaller.

For smaller θ, export sector gains and import-competing sector losses become trivial once the FTA is formed, therefore the sum of rents in all sectors becomes hardly distinguishable under endogenous versus fixed tariffs. Yet, two points of distinction remain: an improvement in consumer surplus and a smaller reduction in tariff revenue due to trade created under endogenous tariffs (but not under fixed tariffs assumption.) Combining the results of increased feasibility under lower values of a under both tariff rules, with the distinction arising for smaller values of θ, we obtain the novel finding of a larger feasible set of FTAs under endogenous tariffs. In sum, when import-competing sectors are relatively smaller and the government places a higher weight on the well-being of lobbies as compared to average citizens, FTAs are more likely to come into existence under endogenously determined tariffs in a political equilibrium as compared to the ones operating under the assumption that external tariffs will be fixed at their pre-FTA politically determined level.

4.1 Further Discussion

Our analysis of FTAs relies on what Grossman and Helpman (1995) label as the "enhanced protection" case in the sense that exporters from each FTA partner obtain higher prices due to higher tariff rates in their partner's market after the agreement. This setup also means pure trade diversion (i.e. no trade creation) under the fixed tariffs assumption and a sufficiently high trade diversion under endogenous tariffs. Therefore, it provides a good comparison point for the two different tariff rules given the recognized increase in feasibility under trade diversion in both Grossman and Helpman (1995) and Krishna (1998) operating

with the fixed tariffs assumption.

A second case covered by Grossman and Helpman (1995) is labeled as "reduced protection" and comes about when the supply of the partner's exporters is more than the import demand of the importing partner at the exporter's pre-FTA price. Therefore, this would occur if X_i^* (X_k) intersected M_i (M_k^*) at a price below p_i^* (p_k). When the possibility of lobbying by producers for or against the FTAs is assumed away, such agreements can be feasible when we recognize the naturally occurring trade creation (with a positive effect on welfare). However, in our paper where the political process affecting protection is assumed to encompass the FTA formation as well, the FTAs surely get blocked in the "reduced protection" case because exporters do not gain from FTAs anymore and import-competing lobbies lose, as shown in Grossman and Helpman (1993) assuming external tariffs are fixed at their pre-FTA levels. The identical result of FTAs getting blocked by the lobbies applies to the assumption of endogenous tariffs as well with the same reasoning.

Finally, an intermediate case involves the situation where the total supply of exporting FTA-partner intersects the import demand of the importing partner in a given sector at a price between the pre-FTA prices in the two markets. That is, the case where X_i^* (X_k) intersects M_i (M_k^*) at a price below p_i (p_k^*) but above p_i^* (p_k). Indicating there is nothing new in this case as it combines features of the two other cases, Grossman and Helpman (1995) do not analyze it. In this case, the equilibrium price in import sector i (k) after the FTA reduces to the one obtained at the intersection point of X_i^* (X_k) and M_i (M_k^*). There is naturally both trade creation and trade diversion, and FTAs are feasible for certain parameter values. More specifically, FTAs are feasible when the gains in the export sectors and the welfare improvements due to trade creation outweigh the losses in the import sectors and welfare reduction due to trade diversion. Since the intermediate case involves all imports being supplied by the partner after the FTA at the reduced price determined by market clearance, the assumption of external tariffs being fixed or endogenous becomes irrelevant. Therefore, there is nothing to compare in the intermediate case hence it is not studied here.

Note that the assumption of inelastic supply curves using the same parameterization in Grossman and Helpman (1995) is mainly for analytical simplicity and provides a more tractable exposition. Since the analysis is ultimately restricted to the "enhanced protection" case, it does not have any effect on the results. However, the welfare effects would be different in the "reduced protection" and intermediate cases under more general functional forms and yet those cases are irrelevant for our study as explained above.

In our small country setup, the optimal tariffs are zero. Assuming a large country setup would provide positive optimal tariffs which compounded with lobbying for protection would lead to higher tariff levels overall. Yet, the downward pressure on external tariffs after the formation of the FTA would still be present. For instance, Ornelas (2005a) shows that an FTA basically decreases the gap between political and optimal tariffs.

Now, returning to our main setup with an alternative illustration approach, Figure 4 depicts six different charts that are sorted increasing in θ, with a on the horizontal axis and s on the vertical axis. Similar to Figure 3, in each chart, the feasible set of FTAs under the fixed tariffs assumption (i.e. equation (19)) is depicted by the light blue region enclosed in solid lines, whereas the feasible set of FTAs under the endogenous tariffs assumption (i.e. equation (20)) is depicted by the grey region enclosed in black dashed lines. The vertical red dashed line in each chart is an upper bound restriction for a which is obtained by re-arranging equation (21) in terms of a.[19] Figure 4 reaffirms the larger feasible set under endogenous tariffs for the low θ and low a combination but clearly shows that endogenizing external tariffs significantly curtails feasibility of FTAs in the context of a wider range of parameter values.

[FIGURE 4 ABOUT HERE]

How realistic is our result? Baier and Bergstrand (2004) empirically analyze the conditions that make FTAs more probable using a probit model and show that countries of similar

[19] That is, $a < [(2\theta - 1)/(1 - \theta)]$.

economic size are more likely to form FTAs which is a result confirmed by for example, Egger and Larch (2008) among others. Although this measure is at the aggregate GDP level, our model's finding of increased feasibility set for endogenous tariffs in the case of relatively smaller import sectors (i.e. with θ close to 0.5) also indicate a similar size of export sectors due to symmetry, hence it is indirectly supported by their empirical findings. It is beyond the scope of this paper but 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.

5 Concluding Remarks

In a political economy setup with small economies 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), we 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 we relax the assumption of fixed tariffs and endogenize the tariff formation, we find that a greater number of FTAs will be deemed to be infeasible due to the loss in the import-competing sectors from the decline in tariffs. Nevertheless, if the size of the import sectors are relatively smaller and the government places a sizable weight on the well-being of producer lobbies relative to taxpayers, an FTA may be more likely to be feasible under endogenous tariffs than under the assumption of fixed tariffs. This is because in the smaller import sector case, the change in sum of rents for import and export sectors is small but under endogenous tariffs we observe improvement in consumer surplus and less reduction in tariff revenue unlike fixed tariffs which provides a

larger set of parameter values deeming FTAs feasible.

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 indicate $\lambda = 1$ 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

$$CS(p) = \sum_{i=1}^{N} [\int_{c_i=0}^{c_i=D_i(p_i)} p_i dc_i - p_i D_i(p_i)] = \sum_{i=1}^{N} \left[u_i\left(D_i(p_i)\right) - p_i D_i(p_i)\right] \tag{22}$$

Equation (8)

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

$$\begin{aligned} \frac{\partial G(p)}{\partial \tau_i} &= (1+a)X_i(\tau_i) + a\left[M_i(\tau_i) + \tau_i M_i'(\tau_i) - D_i(\tau_i)\right] \\ &= X_i(\tau_i) + a\tau_i M_i'(\tau_i) \end{aligned} \tag{23}$$

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:

$$(1+a)\left[Ns\Delta\pi_i + N(1-s)\Delta\pi_k\right] + a\left[Ns(\Delta CS_i + \Delta TR_i) + N(1-s)(\Delta CS_k + \Delta TR_k)\right] \geqslant 0 \tag{24}$$

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:

$$\Delta\pi_k = (1-\theta)X\left[\frac{\theta X-(1-\theta)X}{ab}\right] = \frac{(1-\theta)(2\theta-1)X^2}{ab} \tag{25}$$

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:

$$\Delta TR_i = -(\tau_i)(X_i^*) = -\left[\frac{\theta X}{ab}\right][(1-\theta)X] = -\frac{(1-\theta)\theta X^2}{ab} \tag{26}$$

$$\Delta TR_k = (\tau_k)(X_k) = \left[\frac{(1-\theta)X}{ab}\right][(1-\theta)X] = \frac{(1-\theta)^2X^2}{ab} \tag{27}$$

Plugging these in equation (24), gives the feasibility condition in equation (12)

$$s \leq \frac{2\theta-1+a\theta}{2\theta-1+2a\theta} = \frac{1}{1+\frac{a\theta}{a\theta+(2\theta-1)}} \tag{28}$$

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

$$\begin{aligned}\frac{\partial G(p)}{\partial \tau_i} &= (1+a)X_i(\tau_i) + a\left[M_i(\tau_i) - X_i^*(p_i) + \tau_i(M_i'(\tau_i) - X_i^{*\prime}(p_i)) - D_i(\tau_i)\right] \\ &= X_i(\tau_i) - aX_i^*(p_i) + a\tau_i[M_i'(\tau_i) - X_i^{*\prime}(p_i)]\end{aligned} \tag{29}$$

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

$$u_j\left(D_j(p_j)\right) = \frac{D}{b}D_j(.) - \frac{D_j(.)^2}{2b} \tag{30}$$

Plugging equation (30) in equation (22) 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

$$\begin{aligned}
\Delta CS_i &= \frac{b}{2}\left[\left(1 + \frac{\theta X - a(1-\theta)X}{ab}\right)^2 - \left(1 + \frac{\theta X}{ab}\right)^2\right] + \frac{D(1-\theta)X}{b} \\
&= \frac{(1-\theta)X}{b}\left(D + \frac{(1-\theta)X}{2} - \frac{\theta X}{a} - b\right) \qquad (31) \\
\Delta\pi_i &= \theta X\left[\frac{\theta X - a(1-\theta)X}{ab} - \frac{\theta X}{ab}\right] = -\frac{\theta(1-\theta)X^2}{b} \qquad (32)
\end{aligned}$$

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

$$\begin{aligned}
\Delta CS_k &= \frac{b}{2}\left[1 - \left(1 + \frac{(1-\theta)X}{ab}\right)^2\right] + \frac{D(1-\theta)X}{ab} \\
&= \frac{(1-\theta)X}{ab}\left(D - b - \frac{(1-\theta)X}{2a}\right) \qquad (33) \\
\Delta\pi_k &= (1-\theta)X\left[\frac{\theta X - (a+1)(1-\theta)X}{ab}\right] = \frac{(1-\theta)X^2}{ab}\left(2\theta - a(1-\theta) - 1\right) \qquad (34)
\end{aligned}$$

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:

$$\Delta TR_i = -(\tau_i)(X_i^*) - (\tau_i - \tau_i^{fta})(Q_1 - X_i^*) + \tau_i^{fta}(Q_2 - Q_1) = \frac{(1-\theta)X}{b}\left(b - D + \frac{\theta X}{a}\right) \tag{35}$$

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

$$\Delta TR_k = -(\tau_k)(Q_3) = \frac{(1-\theta)X}{ab}\left(b - D + (1-\theta)X(\frac{1}{a}+1)\right) \tag{36}$$

Plugging these in equation (24), gives

$$\left\{\left[\frac{3\theta}{2a} - \frac{1}{2a} + 2\theta - a + a\theta - 1\right] + s\left[-\frac{3\theta}{2a} + \frac{1}{2a} - 3\theta + \frac{3a}{2} - \frac{5a\theta}{2} + 1\right]\right\} \geq 0 \tag{37}$$

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

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FIGURE 1: Import Sector

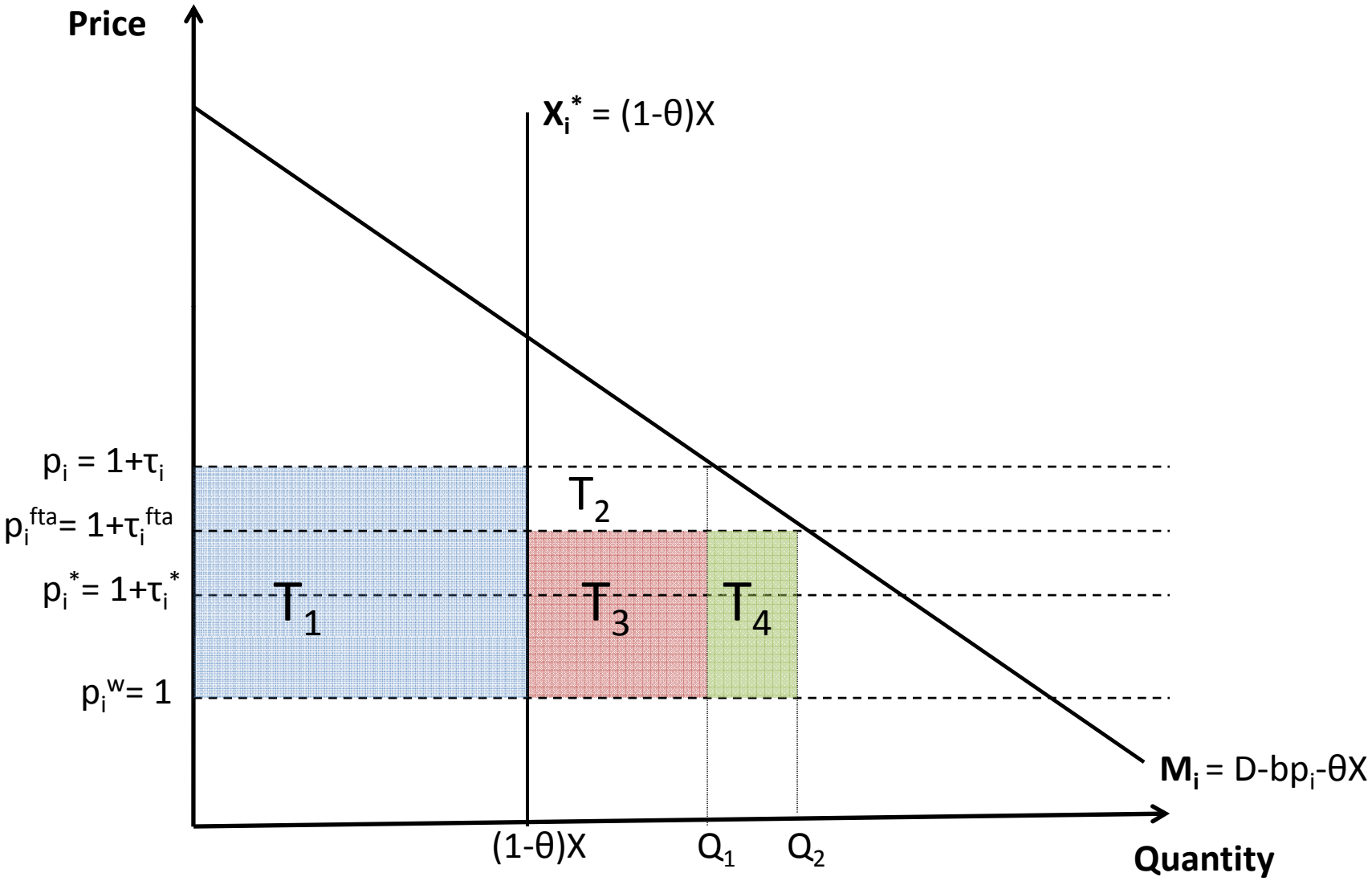

FIGURE 2: Export Sector

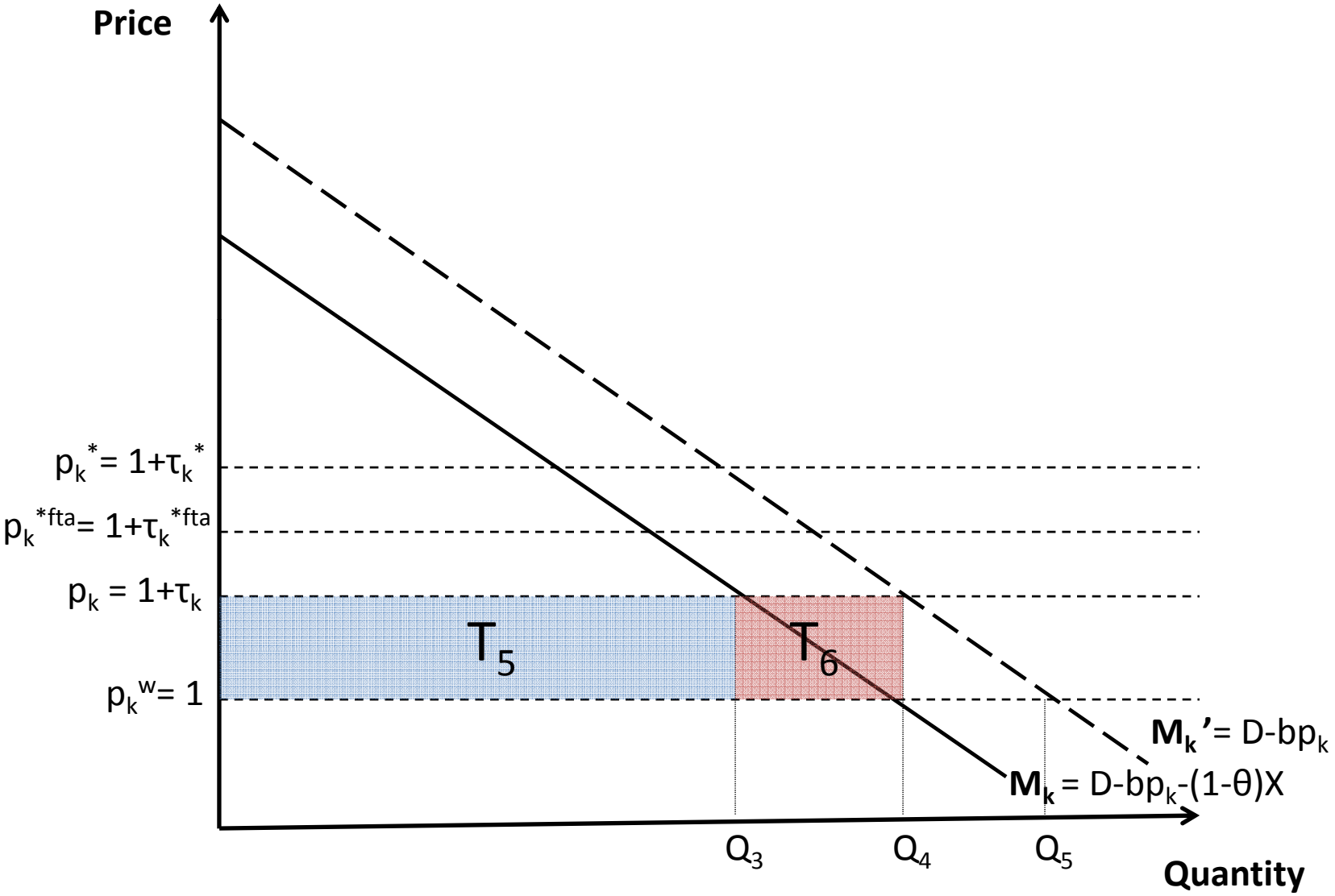

FIGURE 3: Feasibility of FTAs

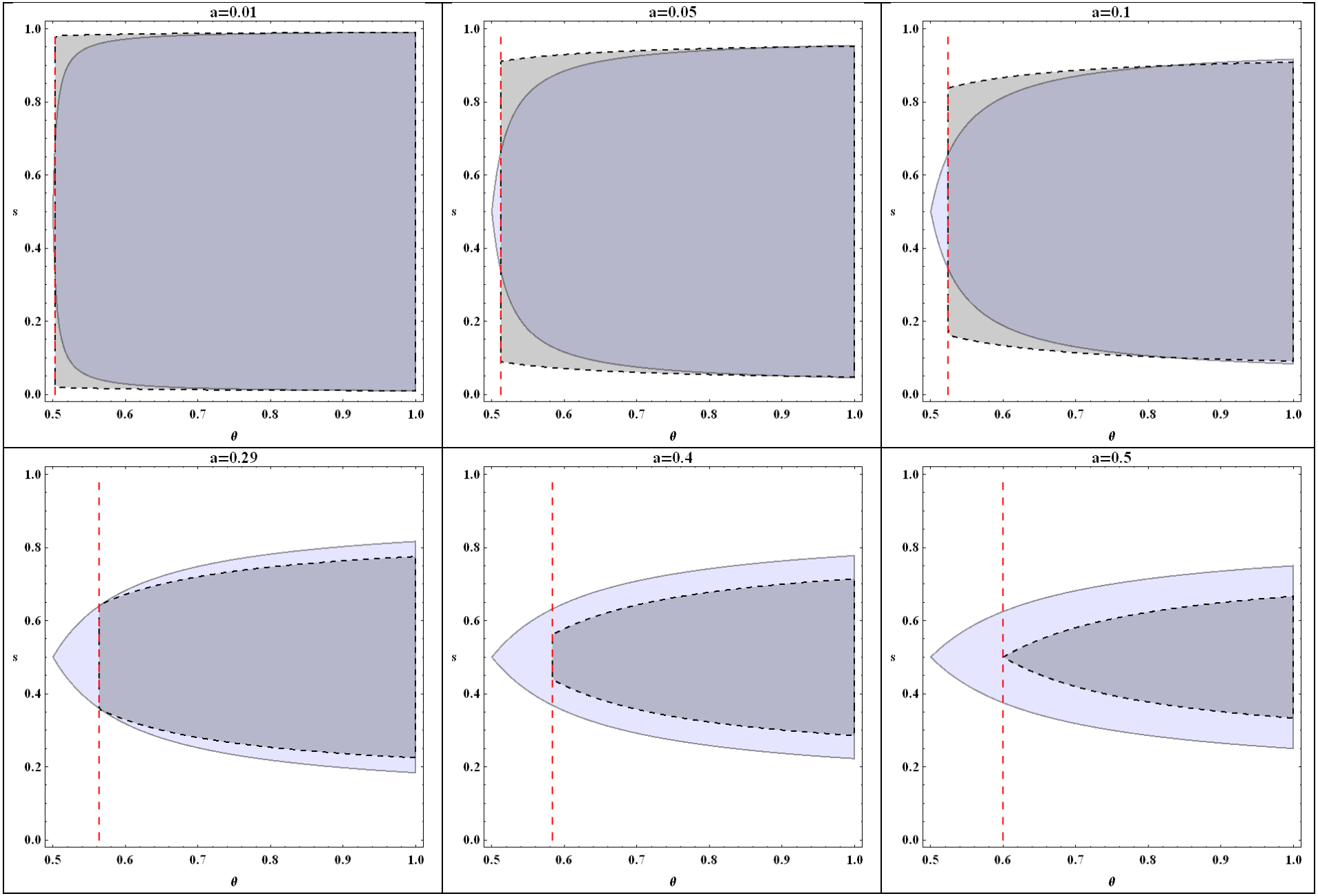

FIGURE 3: Feasibility of FTAs (continued…)

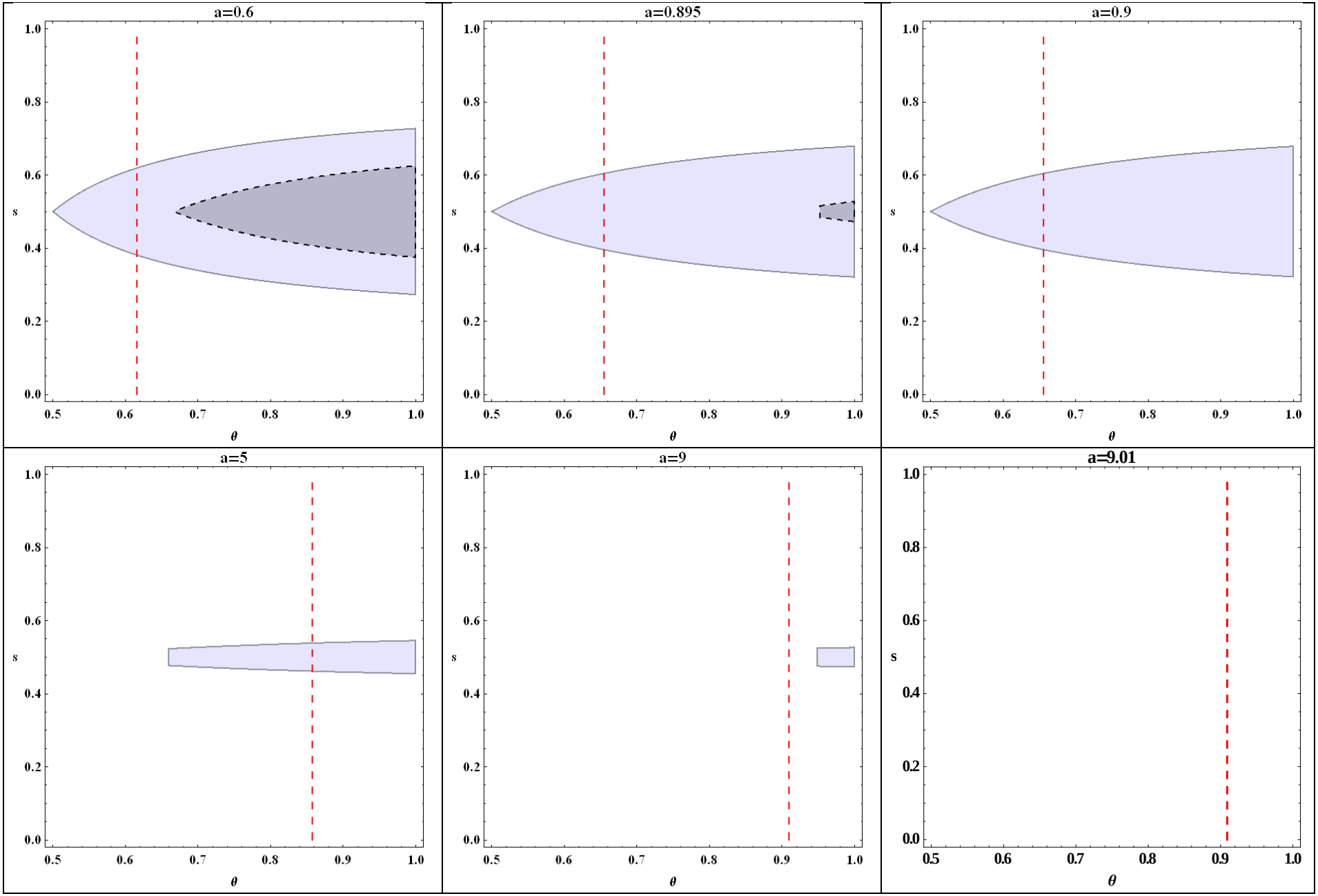

FIGURE 4: Feasibility of FTAs