How Does Import Market Power Matter for Trade Agreements?*

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Abstract

Trade agreements are often viewed as mechanisms that prevent each signatory from using its import market power to manipulate its terms of trade to the detriment of the other signatories. Under a fully efficient trade agreement, therefore, negotiated restrictions on the policy space must be independent of each country's market power. Under the WTO, however, negotiated tariffs are significantly correlated with the import market power of the importing country, which is a manifestation of inefficiency in trade agreements under neoclassical models of trade. We evaluate two potential causes of deviation from the first-best outcome in WTO negotiations: *(i)* a free-riding problem that may be caused by the WTO's nondiscrimination requirement, and *(ii)* asymmetric information about government preferences. Theories based on the above two causes generate starkly different predictions about the pattern of negotiated tariffs. Using WTO tariff data, we find that the pattern of negotiated tariffs is consistent with the implication of a negotiation model under asymmetric information. Finally, we use the model together with data on negotiated and applied tariffs under the WTO to predict the tariff rates that politically-motivated governments would choose in the absence of WTO commitments.

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1 Introduction

Negotiated tariffs under the WTO vary substantially across industries and countries. Standard economic theories of trade agreements attribute this variation to politics: There must be less liberalization in industries in which the government of the importing country is under more political pressure to soften competition from abroad. According to this view, the objective of trade agreements is to prevent a prisoner's dilemma in which each country engages in a futile attempt to improve its terms of trade by limiting imports, only to have its attempts canceled out by similar actions of other countries. Therefore, as articulated by Bagwell and Staiger (1999), under a fully efficient trade agreement politics will be the only cause of variation in negotiated tariffs, implying that a country's import market power must have no bearing on the level of negotiated tariffs.

It should come as no surprise that trade agreements in the real world show significant signs of inefficiency. This is confirmed by studies that establish a significant correlation between import market power and negotiated tariffs, which–as noted above–is a manifestation of inefficiency in trade agreements under neoclassical models of trade. Different theories have been proposed regarding the cause of inefficiency in negotiated tariffs, including *(i)* a free-riding problem that may be caused by the WTO's nondiscrimination requirement, and *(ii)* asymmetric information about government preferences. Theories based on the above two causes generate starkly different predictions about the relationship between import market power and negotiated tariffs.

An understanding of the causes of inefficiency in trade agreements is key to evaluating future proposals to reform the institutions of international trade. If there is evidence that the MFN clause has caused a substantial deviation from efficiency, a reform proposal in the WTO would have to address the problem of free riding by either relaxing the requirements of the MFN clause or by requiring countries to cut tariffs based on a formula rather than voluntary bilateral negotiations. In contrast, if asymmetric information is shown to be the primary cause of inefficiency in the WTO, more attention should be given to the WTO dispute settlement process and flexibility mechanisms such as safeguards and antidumping.

Our objective in this paper is to evaluate the effect of free-riding and asymmetric information on the pattern of negotiated tariffs under the auspices of the WTO. We base our analysis on the premise that the role of trade agreements is to internalize the Terms-of-Trade (ToT) externality of unilateral trade policies, but various obstacles in the negotiation process—such as the free-riding incentives and asymmetric information—may prevent the parties from fully internalizing these externalities. Within this framework, import tariffs could improve a country's ToT at the expense of foreign countries by dampening the world price of its imports. Assuming efficient negotiations, a standard ToT analysis implies that any variation in negotiated tariffs should solely reflect the political-economy preferences of the governments across products—i.e., negotiated tariffs must be *independent* of the import market power of the importing country (Bagwell and Staiger 1999, 2002 and Grossman and Helpman 1995). In contrast, in the absence of a trade agreement, unilaterally chosen tariffs will be increasing in the level of the country's import market power in the respective sectors.

Ludema and Mayda (2013), henceforth LM, argue that because of the MFN-driven free-riding problem, the WTO members were unable to completely internalize the externalities of import tariffs. To elaborate, consider a case where multiple countries export a particular good to a specific importing country. Interested exporting countries could participate in formal negotiations with the importing country through which they would offer individual concessions to the importing country in exchange for tariff cuts. Because of the MFN clause, negotiated tariff cuts will be applied to imports from all WTO members regardless of whether they participated in the negotiations.[1]

In deciding whether to participate in tariff cut negotiations with the importing country, an exporting country faces a tradeoff: By participating in the negotiations, an exporting country gives more incentive to the importing country to undertake a deeper tariff cut but it will also have to offer concessions of its own. Therefore, an exporting country will join the negotiations if and only if it has a sufficiently large stake in it, namely, iff it supplies a sufficiently large fraction of the importing country's demand.

Because the participation of the interested exporting countries in tariff-cut negotiations is incomplete, the negotiated tariffs will not fully internalize the terms of trade effect of tariffs. As a result, the negotiated tariffs will be still increasing in the import market power of the importing countries, especially in products where the free-riding problem is more severe.

[1] Wong (2017) and Saggi et al. (2019) also provide theoretical investigations of the MFN-driven free-riding problem.

The delegation theory of tariffs offers a starkly different hypothesis regarding the pattern of tariff commitments under the WTO. Based on a delegation theory of tariffs (Bagwell and Staiger 2005 and Amador and Bagwell 2013), Beshkar, Bond, and Rho (2015), henceforth BBR, argue that if governments care about flexibility in setting their trade policy (due to uncertain political-economy preferences, for example), the optimally-negotiated tariffs must depend *negatively* on the importing country's import market power. This negative relationship arises from the tradeoff between flexibility and externality: A higher negotiated tariff offers more flexibility while at the same time opens the door for greater negative externality from tariffs.[2] Therefore, it is jointly optimal for the governments to put a stricter bound on tariffs in sectors that generate greater international externalities, i.e., sectors in which the importing country has a stronger import market power.

We evaluate, both theoretically and empirically, the potential roles that the MFN-driven free-riding and the flexibility-externality tradeoff play in the design of trade agreements. To this end, we extend the analyses of LM and BBR by proposing a hybrid model that incorporates the potential role of free riding in the tradeoff between flexibility and externality. Our model, therefore, provides a framework to compare the empirical relevance of the opposing patterns predicted by the flexibility-externality tradeoff and the free-riding problem. A careful empirical analysis of this matter requires a conceptual model that allows for the existence of these patterns of tariff commitments with and without an MFN-driven free-riding problem. Our strategy, therefore, is to develop a hypothesis based on the free-riding theory and test it against alternative hypotheses regarding the variation of negotiated tariffs across countries and sectors.[3]

A novel theoretical result—different from that of LM and BBR—arises under our hybrid model: In the presence of the MFN-driven free-riding problem, the effect of the Import Market Power (IMP) on the negotiated tariff caps is *non-monotonic* (see the solid graph in Figure 1): In particular, there is a threshold of IMP below

[2]The central premise of this theory is that governments have asymmetric information about the state of the world or shocks to a government's preferences. As a result of information asymmetry, the governments are unable to negotiate an efficient agreement that is contingent on the realized state of the world.

[3]The advantage of our approach is to consider alternative theories of inefficiency in trade agreements within the same framework. The importance of considering well-defined alternative hypotheses in empirical analyses is well-known. However, Leamer's (1984, p. 46) critic that "the trade theories have usually been examined empirically without a clear statement of any alternative" continues to be relevant today.

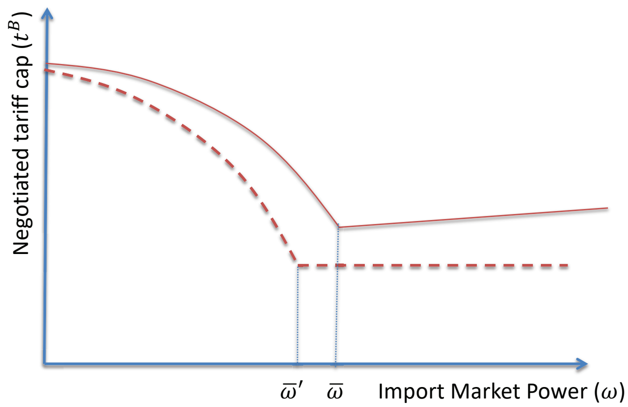

Figure 1: Negotiated tariff caps as a function of import market power. The solid (dashed) graph is related to a case with (without) an MFN-Driven Free-Riding Problem. See Proposition 1 for details.

(above) which the negotiated tariff cap is decreasing (increasing) in IMP.[4] In the absence of a free riding problem, this relationship is non-increasing as depicted by the dashed graph in Figure 1.

The above threshold of IMP also divides tariff lines into two groups: If the IMP is below this threshold, the negotiated tariff caps are *weakly binding*, meaning that under some states of the world, the importing country finds it optimal to choose a tariff below the cap, thereby generating a *tariff overhang*.[5] For values of IMP above this threshold, however, the negotiated caps are *strongly binding*, namely, the importing country will find the negotiated cap restrictive under all states of the world and, hence, no tariff overhang is ever observed.

We test and compare the hypotheses of the above theories using the tariff binding data from the WTO, trade volumes, and various proxies for countries' import market power in an industry. Our empirical findings strongly point to the tradeoff between flexibility and externality in negotiated tariff caps: Generally, negotiated tariffs are negatively related to the country's import market power in the concerned products. On the other hand, the predictions of the MFN-driven free riding theory are generally inconsistent with the observed variation in the data.

[4]This finding modifies the results of both LM and BBR who claimed, respectively, that negotiated caps are increasing and non-increasing in IMP.

[5]This phenomenon is sometimes referred to as water in tariff.

Recall that while a pure free-riding model predicts a positive causal relationship between IMP and negotiated tariff bindings, a pure flexibility-externality model predicts a negative relationship. Our empirical finding that this relationship is in fact negative does not necessarily mean that free-riding did not affect WTO negotiations, because it could merely imply that the effects of free riding were dwarfed by the effect of a preference for flexibility in tariff obligations. As suggested by our theory, the potential effects of free riding may be isolated from the effect of flexibility-externality tradeoffs in the subsample of strongly-bound tariff lines. That is because in this subsample the net value of flexibility is always negative and, thus, no flexibility is afforded to the government under the agreement. Therefore, among strongly-bound tariff lines, the relationship between negotiated tariffs and IMP is only affected by free-riding. Implementing this strategy, however, does not produce any evidence in favor of the free-riding hypothesis.

We confirm the main estimation results of LM that negotiated tariffs are increasing in the Product Differentiation Index (PDI). However, based on our model, we offer a different interpretation of this relationship. The difference between our empirical results and those generated in LM is primarily due to the use of different proxies for IMP and negotiated tariffs. As their main measure of IMP, LM use the degree of *product differentiation,* while we use the estimated inverse of the foreign export-supply elasticity.[6]

We argue that LM's finding that tariffs are increasing in the degree of product differentiation reveals the role of *Ramsey Taxation*, rather than ToT effects, in trade agreements. To see this, note that the degree of product differentiation is a direct measure of *demand elasticity* such that products with a lower degree of differentiation have a higher demand elasticity. Moreover, as we know from political-economy models such as Grossman and Helpman (1995), efficiently-negotiated tariffs are lower in products with more elastic demand. This result reflects a simple Ramsey Taxation argument in political-economy trade models: As also pointed out by Goldberg and Maggi (1999), in products with a higher demand elasticity, it is more costly for the government to transfer welfare to producers by means of taxing imports. Therefore, efficiently-negotiated import tariffs must be higher in

[6]For robustness check, we also use world import shares and import volumes as alternative measures of import market power. Moreover, as their main measure of negotiated tariffs, LM use applied tariffs, which are different from negotiated tariffs in a substantial fraction of the tariff lines. An important advantage of our framework is that it specifically accounts for the difference between negotiated caps and applied tariffs, which is a prevalent feature of the observed tariffs in the WTO.

products with a greater degree of product differentiation.[7]

Finally, we provide a simple procedure to predict unilaterally-optimal tariffs based on observed negotiated tariff caps and applied tariffs under the WTO. While the variation in the political-economy weights of import-competing industries is at the core of the tariff overhang model, we lack an empirical measure of the political-economy weights. The model, however, suggests that the pattern of applied and negotiated tariffs across industries and countries contains a wealth of information about the political-economy weights. Using our results on the relationship between negotiated tariff caps, applied tariffs, and export supply elasticities, we back out the political weight of each industry-country pair. We then use these calibrated weights to predict the tariffs that would be chosen by each country in the counterfactual in which countries are not bound by any caps on their applied tariffs.

There are a few previous attempts at predicting applied tariffs that reflect the political-economy influence of different industries in the absence of trade agreements. Notably, Ossa (2014) calibrates political economy weights based on the variation in non-cooperative tariffs across industries. The data on non-cooperative tariffs (namely, tariffs imposed on non-WTO members) is available only for a few countries. In contrast, our approach enables us to make this prediction for all country-industry pairs for which data on applied and negotiated tariffs are available.

These back-of-the-envelope calculations yield a prediction of unilaterally-optimal tariffs that reflect each industry's political weight in the objective function of governments across the world. In particular, the median of optimal tariffs for countries ranges from 8% for Georgia to 73% for Bangladesh. The United States has the second highest median optimal tariffs at 64%. This analysis yields a large estimate of optimal tariff for many small and developing countries with low import market power, which reflects the strength of political motives in trade policy making in those countries. For example, in the absence of political weights, the median optimal tariff for Bangladesh is 7%, which is an order of magnitude smaller than the median of its politically-optimal tariffs. For the United States and European Union, however, the difference between political and nonpolitical optimal tariffs are much smaller.[8]

[7] Also note that Product Differentiation Index does not vary across countries and it suppresses any determinants of import market power that emanate from the size of imports.

[8] For more information on predicted optimal tariffs, see Table 10 and Figure 4 in Subsection 7.

After a brief discussion of the related literature in the next section, we lay out our basic economic environment in Section 3 and introduce our model of negotiated tariffs in Section 4. In Section 5, we describe the data and proxies that we use. In section 6, we present our empirical methodology and findings. In Section 7, we discuss a simple procedure to predict unilaterally-optimal tariffs based on observed negotiated tariff caps and applied tariffs. Section 8 provides concluding remarks.

2 Related Literature

Our empirical findings confirm Bagwell and Staiger's (2011) observation that WTO negotiators, in effect, negotiated to limit the adverse ToT effects of unilateral trade policy. The additional insight from this paper is that in products with a lower degree of ToT externality, trade negotiations left room for unilateral flexibility and, hence, did not eliminate the ToT effects completely. Importantly, we also find that the failure to eliminate ToT effects does not seem to be driven by the free-riding problem.

In addition to limiting the ToT externality of unilateral trade policy, tariff-cut negotiations could also limit the ability of governments to use trade policy to *"delocate"* production from foreign countries to home.[9] As elaborated by Ossa (2011), the GATT/WTO negotiations, and especially the principle of reciprocity used in the negotiations, could be interpreted as an attempt to eliminate inefficient policies that are aimed at replacing imports with domestic production. In practice, the ability of the governments to delocate production is likely to be correlated with their ability to manipulate their ToT. Therefore, it would be difficult to empirically disentangle the ToT and delocation effects. Nevertheless, to the degree that ToT and delocation effects are correlated, our empirical results may also indicate the tradeoff between flexibility and *delocation* externality in tariff binding negotiations.

This paper highlights the existence of *unilateral* flexibility, i.e., tariff overhang, in the WTO and its implication for the variation of tariff commitments across products and countries.[10] There are, however, various other *contingent* flexibility measures–such as that have likely affected the structure of tariff commitments under

[9] For an in-depth discussion of various goals that trade agreements may achieve, see Maggi (2014), Grossman (2016) and Bagwell et al. (2016).

[10] Several studies, including Estevadeordal et al. (2008) and Bown (2014), confirm that countries use the policy flexibility provided by tariff overhang to adjust their applied tariffs unilaterally.

the WTO. Moreover, there is potentially a substitutability between tariff overhang and contingent protection measures. For example, Beshkar and Bond (2017) show that, theoretically, the availability of an escape clause leads to lower tariff binding commitments in products with greater import market power. Various empirical works provide evidence for the substitutability of alternative flexibility measures: Prusa and Li (2009) show that the use of antidumping measures are inversely related to the existence of tariff overhang. Similarly, Kuenzel (2017) show that a WTO dispute is more likely to arise in products with lower tariff overhangs. Finally, the empirical analysis of Bown and Crowley (2013) suggest that the ToT effects may influence the decision to adopt contingent protection measures.

3 The Basic Environment

In this section, we introduce a model of trade agreement under political uncertainty and the free-riding problem caused by the GATT/WTO's nondiscrimination clause, also known as Most-Favored Nation (MFN) Clause. We first briefly discuss the existing terms of trade models of tariff negotiations that emphasize the role of uncertainty and free-riding problem, respectively. We then offer a hybrid model that incorporates both of these issues.

Trade agreements are often viewed as a solution to the inefficiencies arising from noncooperative policymaking. An import tariff improves a country's terms of trade by depressing the world price of the imports, while generating a negative externality on the exporting countries. As argued by Bagwell and Staiger (1999), remedying the ToT externality is the sole benefit of trade agreements within a wide range of neoclassical trade models.

Consider an importing country, henceforth Home, with the following political welfare function for a given product:

$$V(t;\theta) \equiv S(p(t)) + (1+\theta)\Pi(p(t)) + tp^*(t)m(p(t)), \tag{1}$$

and an exporting country with the following welfare function in product k:

$$V^*(t) \equiv S^*\left(p^*\left(t\right)\right) + \Pi^*\left(p^*\left(t\right)\right), \tag{2}$$

where, $S(p)$, $\Pi(p)$, and $m(p)$ are the consumer surplus, the producer surplus, and the import demand function, respectively, and $*$ indicates the corresponding variables for the exporting country. Moreover, the political parameter, θ, is the extra weight that the government assigns to the producer surplus compared to tariff revenues and consumer surplus.

Optimal noncooperative tariff of Home solves $t^N(\theta) = \arg\max_t V(t;\theta)$, which is implicitly given by

$$t^N = \omega + \theta\left(\frac{1+t^N}{\eta}\right), \tag{3}$$

where, $\omega = \left(p^* \frac{m^{*\prime}}{m^*}\right)^{-1}$ is the inverse of the Foreign export supply elasticity, and $\eta = -\frac{pm'}{y}$ is the product of the home import demand elasticity and the import penetration ratio. The noncooperative tariff, therefore, is increasing in the importing country's IMP, ω.[11]

The import demand elasticity of a product affects the level of the noncooperative tariff if and only if the government values the welfare of producers and consumers differently, i.e., iff $\theta \neq 0$. In particular, if $\theta > 0$, the noncooperative tariff is decreasing in the product's elasticity of demand. This relationship is akin to the Ramsey taxation idea: transferring welfare from consumers to producers is more costly the more elastic is the demand for that product. Therefore, the optimal tariff is decreasing in import demand elasticity.

The jointly efficient tariffs, i.e., the tariff rate that maximizes the joint welfare of the importing and the exporting countries, is the solution to $t^E(\theta) = \arg\max V(t;\theta) + V^*(t)$. Solving this problem yields the efficient tariff

$$t^E(\theta) = \frac{\theta}{\eta - \theta},$$

which is independent of the importing IMP, ω. Therefore, under an efficient trade agreement, any variation in negotiated tariffs should be independent of the variation in IMP and must solely reflect the preferences of the governments for income distribution and the cost of transfers as determined by demand elasticity and import penetration embodied in η.

[11]Our analysis is conducted under a partial equilibrium model and we abstract from the presence of intermediate goods. Recent papers have shown that taking into account the general equilibrium linkages across products as well as the global input-output linkages generate intriguing results that are absent from our model (Beshkar and Lashkaripour, 2019, 2020). Nevertheless, the basic observation of our partial-equilibrium model remains true under those more general settings, namely, when countries have import market power at the level of products or industries, optimal tariffs will be inversely related to the foreign country's export supply elasticity.

The theoretical finding that efficiently-negotiated tariffs are independent of countries' IMP hinges on two key assumptions: *1) negotiations are perfectly efficient;* and *2) there is no uncertainty about the trade policy preferences of the governments.* In the next section, we relax both of these assumptions and show how ToT effects will affect the level of negotiated tariffs.

4 Multilateral Tariff Cap Negotiations

We propose a model of tariff negotiations that incorporates two main elements. First, multilateral negotiations may be affected by an MFN-driven free-riding problem. Second, the negotiators try to strike a balance between a desire for flexibility in tariff commitments and a desire for preventing beggar-thy-neighbor behavior in setting tariffs.

Free Riding The basic premise of the MFN-driven free-riding model is as follows. Some exporting countries may prefer to stay out of negotiations since the MFN rule allows them to receive the benefit of tariff cuts negotiated by other countries without having to offer any concessions in return. We let P and $\varphi(P)$ denote, respectively, the set of countries that participate in the negotiations and the fraction of the importing country's imports in this product that comes from these countries. Due to the free-riding problem $\varphi(P) < 1$. Moreover, the more severe the free riding problem is the lower is $\varphi(P)$. For brevity, we henceforth use φ instead of $\varphi(P)$.

As demonstrated by LM, the severity of the free-riding problem depends on the distribution of the export volumes from different countries: the more dispersed is the volume of exports the greater is the free-riding problem since most countries benefit little from negotiations. In contrast, if most of the export is originated from a small number of countries, the importing country will face more aggressive demands for liberalization and, thus, the negotiated tariffs will be lower. Therefore, we follow LM's finding and assume that $\varphi(P)$ is decreasing in the degree of exporter concentration.

The Tariff Cap Mechanism As in Amador and Bagwell (2013) and Beshkar, Bond, and Rho (2015), we assume that tariff commitments are in the form of caps on applied tariffs and that the political parameter θ is drawn from a probability distribution, $f(\theta)$. If the tariff cap is sufficiently high, the importing country may find it optimal to apply a tariff below the binding, which generates a tariff overhang. In particular, letting t_B denote the tariff cap for a particular importing country-product pair, the tariff cap is binding if and only if

$$t_N(\theta) > t_B.$$

Therefore, since the unilaterally-optimal tariff, $t_N(\theta)$, is increasing in the political parameter, θ, there is a threshold of the political parameter, given by $\theta_B \equiv t_N^{-1}(t_B)$, below which the importing country finds it optimal to set a tariff below the tariff cap. In particular, given the tariff cap, t_B, the applied tariff is given by

$$t_A(\theta) = \begin{cases} t_N(\theta) & \text{if } \theta < \theta_B, \\ t_B & \text{if } \theta \geq \theta_B. \end{cases}$$

The Objective of Negotiations To reflect the inefficiency caused by the free-riding problem, we follow LM and assume that the negotiators ignore the effect of the chosen tariff cap on the payoffs of the exporting countries that do not participate in the negotiation. More precisely, the objective of the negotiators is to choose a tariff cap that maximizes the expected joint welfare of the importing country and the exporting countries, P, that *participate in the negotiation.* Therefore, the optimal tariff cap, denoted by $t_B(P)$, is the solution to the following expected joint welfare maximization problem:

$$\begin{aligned} t_B(P) = \arg\max_{t_B} \int_{\underline{\theta}}^{\theta_B} \left[V(t_N(\theta); \theta) + \sum_{j \in P} V_j^*(t_N(\theta)) \right] f(\theta) d\theta \\ + \int_{\theta_B}^{\bar{\theta}} \left[V(t_B; \theta) + \sum_{j \in P} V_j^*(t_B) \right] f(\theta) d\theta, \end{aligned} \tag{4}$$

where V_j^* is the welfare of the exporting country j in this product, and θ_B is implicitly defined by $t_B \equiv t_N(\theta_B)$.

The first integral in (4) is the expected joint welfare of the participating countries when the unilaterally optimal tariff is lower than the binding, $t_N(\theta) < t_B$. Therefore, in this region, where, $\theta < \theta_B$, the importing country imposes its unilaterally optimal tariff, and there will be a positive tariff overhang. The second integral is the expected joint welfare of the countries for $\theta > \theta_B$, in which case the applied tariff is equal to the tariff cap.

Optimization Letting $\sum_{j\in P} V_j^*(t) \equiv \varphi V^*(t)$, where $V^*(t)$ is the payoffs of the rest of the world and $\varphi \equiv \varphi(P)$ is the share of the participating countries, the FOC of the optimization problem 4 will be given by:

$$\int_{\theta_B}^{\bar{\theta}} \left[\frac{dV(t_B,\theta)}{dt} + \varphi \frac{dV^*(t_B)}{dt} \right] f(\theta)\, d\theta = 0,$$

Noting that $V(t,\theta) = V(t,0) + \theta\Pi(p(t))$, the FOC may be rewritten as

$$\int_{\theta_B}^{\bar{\theta}} \left[\frac{dV(t_B,0)}{dt} + \varphi \frac{dV^*(t_B)}{dt} + \theta \frac{d\Pi(t_B)}{dt} \right] f(\theta)\, d\theta = 0,$$

or

$$\left(\frac{dV(t_B,0)}{dt} + \varphi \frac{dV^*(t_B)}{dt} \right) \int_{\theta_B}^{\bar{\theta}} f(\theta)\, d\theta + \frac{d\Pi(p)}{dp}\frac{dp}{dt} \int_{\theta_B}^{\bar{\theta}} \theta f(\theta)\, d\theta = 0.$$

Moreover, because $\frac{\int_{\theta_B}^{\bar{\theta}} \theta f(\theta) d\theta}{\int_{\theta_B}^{\bar{\theta}} f(\theta) d\theta} = E[\theta|\theta > \theta_B]$, this FOC may be written in the following form

$$\frac{\frac{dV(t_B,0)}{dt} + \varphi \frac{dV^*(t_B)}{dt}}{\frac{d\Pi(p)}{dp}\frac{dp}{dt}} = E[\theta|\theta > \theta_B].$$

Using the properties of the welfare functions, the first-order condition (FOC) for optimality may be written as

$$(t - (1-\varphi)\,\omega)\, \frac{\eta}{1+t} = E[\theta|\theta > (t-\omega)\, \frac{\eta}{1+t}], \tag{5}$$

where, $\omega \equiv \frac{1}{\epsilon^*}$ is the inverse of foreign country's export supply elasticity, $\eta \equiv \epsilon z$, $\epsilon \equiv -p\frac{m'(p)}{m}$ is import demand elasticity, and $z = \frac{m}{s}$ is the import penetration ratio.

Equation (5) incorporates the two special cases of interest, i.e., BBR and LM. In particular, $\varphi = 1$ represents a case in which the free riding problem is nonexistent, in which case Equation (5) will be identical to that of BBR. The other extreme is the case where there is no uncertainty or fluctuation in the value of the political economy parameter, θ. In this case, the negotiated tariff varies with the degree of the free-riding problem, φ, and the inverse of the foreign country's export supply elasticity, ω, namely,

$$t = \frac{\theta}{\eta - \theta} + \frac{1-\varphi}{1 - \theta/\eta}\omega.$$

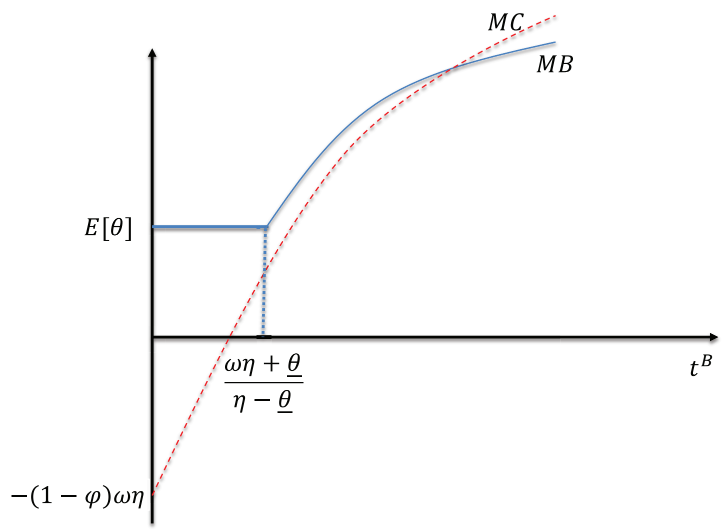

Figure 2: Marginal benefits (Solid Line) vs. marginal costs (dashed line) of raising a tariff cap

Moreover, in the latter case, there will be no tariff overhang, namely, the applied tariffs will be always equal to the negotiated bindings.

Figure 2 illustrates the FOC (5) graphically. The left-hand side of Equation (5)—depicted by the dashed line in the figure—is the Marginal Costs (MC) of tariff for the joint welfare of the importing country and the participating exporters, which is increasing in t. The right-hand side of the FOC (5)—depicted by the solid line in the figure—is the Marginal Benefit (MB) of an increase in tariff, which is increasing in (independent of) t if $t > (\leq) \frac{\omega\eta+\underline{\theta}}{\eta-\underline{\theta}}$. The second-order condition for maximization is satisfied if the MC curve crosses the MB curve from below, as depicted in Figure 2.

The solution to the maximization problem may be an interior solution in which $\theta^B > \underline{\theta}$ or a corner solution in which $\theta^B > \underline{\theta}$. An interior solution arises if the MC curve intersects the MB curve at its increasing segment. Substituting for the threshold value, $t = \frac{\omega\eta+\underline{\theta}}{\eta-\underline{\theta}}$, in the FOC 2, we can see that an interior solution is obtained iff

$$\left(\frac{\omega\eta+\underline{\theta}}{\eta-\underline{\theta}} - (1-\varphi)\,\omega\right)\frac{z\epsilon}{1+\frac{\omega\eta+\underline{\theta}}{\eta-\underline{\theta}}} < E[\theta],$$

or, equivalently,

$$\left(1+\frac{1}{\omega}\right)\frac{1}{\varphi} > \frac{\eta-\underline{\theta}}{E[\theta]-\underline{\theta}}. \tag{6}$$

At an interior solution, the negotiated tariff is higher than unilaterally optimal tariffs under some states of the world, thereby generating tariff overhang. We refer to such negotiated tariff caps as *weak bindings* as they afford the importing country some flexibility in choosing its tariffs. At an interior solution an increase in ω shifts down both MC and MB curves. A downward shift in the MB tends to reduce the optimal binding, while a downward shift in the MC tends to increase the optimal binding. The rate of the shift in MC is slower the larger is φ. In particular, when $\varphi = 1$, MC becomes invariant to ω. Therefore, there must exist a threshold value of φ above which the net effect of an increase in ω on optimal binding is negative.

Proposition 1. *If* $\left(1+\frac{1}{\omega}\right)\frac{1}{\varphi} > \frac{\eta-\underline{\theta}}{E[\theta]-\underline{\theta}}$*, there exists a local optimum under which tariff overhang is positive for some states of the world,* θ*. Moreover, there is a threshold of* φ*, denoted by* $\hat{\varphi}<1$*, such that if* $\varphi > \hat{\varphi}$ *the optimal tariff cap is decreasing in* ω *and this negative association is stronger for higher values of* φ*.*

This proposition states that when IMP (measured by the inverse of foreign export supply elasticity, ω) is relatively low, the relationship between the optimal tariff cap and IMP depends on exporter's participation rate in the negotiation, measured by φ. In particular, for a sufficiently high rate of participation, optimal tariff cap is *declining* in IMP. This negative association is depicted by the declining segment of the solid graph (i.e., where $\omega < \bar{\omega}$) in Figure 1. For sufficiently low φ, this relationship is ambiguous. Nevertheless, for all values of φ, the relationship between the optimal binding and IMP will be *more negative* the higher is φ.

A corner solution arises if the MC curve intersects the MB curve at its flat part. At a corner solution, the unilaterally-optimal tariff is always greater than the optimal tariff cap and, thus, no tariff overhang will ever be observed. In other words, if condition 6 is violated, the optimal tariff cap is strongly binding and no flexibility is afforded to the government of the importing country. We refer to such negotiated tariff caps as *strong binding*.

The position of the flat segment of the MB curve is independent of the level of import market power, ω. However, iff $\varphi < 1$ an increase in ω will shift down the MC curve, which under a corner solution results in an increase in the optimal tariff cap. For this range of parameters, the optimal tariff cap is given by $t_B = \frac{E[\theta]+\eta(1-\varphi)\omega}{\eta-E[\theta]}$. In summary:

Proposition 2. *If* $\left(1+\frac{1}{\omega}\right)\frac{1}{\varphi} < \frac{\eta-\underline{\theta}}{E[\theta]-\underline{\theta}}$*, there will be no tariff overhang under the optimal* *tariff cap. Moreover, if $\varphi < 1$, the optimal tariff cap will be increasing in ω and this correlation diminishes as φ increases. If $\varphi = 1$, the optimal tariff cap is independent of ω.*

This proposition establishes that when IMP is sufficiently large, the optimal tariff cap is *strong*, i.e., no positive tariff overhang arises under any state of the world. Moreover, it states that among strongly-bound tariff lines, the negotiated cap is increasing in the importing country's IMP. This positive association is depicted by the increasing part of the solid graph in Figure 1, where $\omega > \bar{\omega}$. The positive association between negotiated tariff caps and IMP in this range is a consequence of the free-riding problem under which the negotiated tariffs do not fully internalize the ToT externality of tariffs. If no free-riding problem is present, i.e., if $\varphi = 1$, the relationship between the negotiated binding and IMP is given by the dashed graph in this Figure.

The role of demand elasticity We make a final note about the effect of demand elasticity (ε) and import penetration ratio (z) on the optimal level of tariff caps. First, consider the case of a corner solution in which the FOC may be written as

$$(t - (1 - \varphi)\,\omega)\,\frac{\eta}{1 + t} = E[\theta],$$

where, $\eta \equiv \epsilon z$. In this case, a higher import demand elasticity shifts down the MC cost curve in Figure 2 (the left-hand side of the above equation), leading to a decline in the optimal level of the tariff cap. This is in line with the results in Grossman and Helpman (1995) that efficiently-negotiated tariffs are decreasing in the product's demand elasticity. This result reflects a simple Ramsey Taxation argument in political-economy trade models: As also pointed out by Goldberg and Maggi (1999), in products with a higher demand elasticity, it is more costly for the government to transfer welfare to producers by means of taxing imports.

In the case of an interior solution under which the government has some flexibility in setting its import tariffs, the effect of demand elasticity on the optimal level of tariff cap depends on the distribution of political parameter, θ. To see this, note that as demand elasticity rises, the payoffs of a government who has discretion to set its import tariffs unilaterally becomes more aligned with the joint payoffs of all interested parties. As a result, both marginal costs and marginal benefits of a higher tariff cap is increasing in demand elasticity, hence the ambiguous effect of demand elasticity on the optimal level of tariff caps. Nevertheless, as we confirm in the empirical section, negotiated tariff caps are negatively associated with a proxy for demand elasticity, indicating that the net effect of demand elasticity on negotiated tariff caps continues to be negative under a flexible trade agreement.

Transaction costs and unbound tariff lines In the above model we abstracted from transaction costs involved in negotiating a tariff cap. Introducing a fixed cost of negotiation per tariff line to the above model is straightforward and generates a new result, namely, the existence of unbound tariff lines. In particular, for tariff lines in which unilateral tariffs have only a small externality on exporting countries, it may not be worthwhile for countries to pay the transaction costs of negotiating a tariff cap, thereby leaving those products without a tariff cap. Many tariff lines are in fact left unbound in the WTO. Moreover, as we will show in the empirical section, the unbound tariff lines in the WTO tend to have low import market power, which is consistent with the implication of transaction costs in our model.[12]

5 Data

We use the World Integrated Trade Solution (WITS) for data on MFN tariff binding and applied tariff rates. A natural choice of data for negotiated tariffs is the MFN binding rates that were negotiated in the Uruguay Round. Since the inception of the WTO in 1995, the MFN binding rates for original members have remained virtually unchanged.[13] For those countries that joined the WTO after 1995, we use the tariff caps that these countries were supposed to implement after a phase-in period. Figure 3 depicts the distribution of the tariff cap commitments.

The WITS provides tariff data that is aggregated at the six-digit level of HS codes. This data provides simple and weighted averages as well as the minimum and maximum of tariff rates under each six-digit industry. For robustness check, we test our hypotheses using each of these variables. We also use categorical variables for tariff caps by rounding down tariff caps to the closest multiple of 5.[14]

[12]We thank an anonymous referee for prompting us to discuss the effect of introducing transaction costs of negotiations to the model.

[13]As their main measure of negotiated tariffs, LM use applied tariffs. However, a central message of this paper is that due to the existence of tariff overhangs that vary substantially across products, using applied tariff rates to proxy for negotiated tariffs could be misleading.

[14]Since our tariff data is constructed from an average of more detailed tariff rates, using this categorical variable could reduce the potential effect of measurement errors arising from averaging of tariffs.

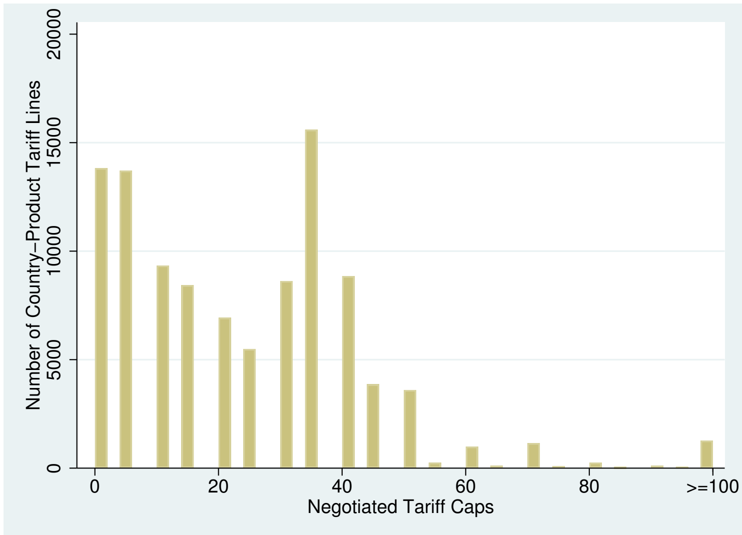

Figure 3: Distribution of tariff cap rates (rounded to the closest multiple of 5)

To calculate overhang status of each country-product, we use the MFN applied tariff rates from 1995 to 2007.[15] We label a tariff line as *strong binding* if there is no positive tariff overhang in any year between 1995 and 2007. Unbound products, i.e., products for which no tariff caps were negotiated, are dropped from the sample.[16] The remaining products, are labeled as weak binding. Only about 24% of product-country pairs in our sample have strongly binding tariff caps, 57% of which are bound at zero.

Measures of Import Market Power

The main explanatory variable in our analysis is Import Market Power (IMP). One of the empirical challenges in testing theories of tariff choices is to find a measure of IMP. Several measures of IMP have been suggested and used in the literature including the inverse of the foreign export elasticity (IFEE), import volume, share of the world imports, and product differentiation. We estimate our regression model using all these IMP measures, which are significantly correlated in our data.

[15] We confirmed that less restrictive definitions of weak binding generate similar results.

[16] As we discussed at the end of Section 4, if negotiating tariff caps involves a transaction cost, tariff lines with sufficiently low import market power will be left unbound because the benefit of reducing the externality of unilateral tariffs could not justify the transaction costs. Alternatively, we can view unbound tariff lines as products for which an arbitrarily high tariff binding is negotiated. Including unbound products in our regressions slightly increases the significance of our results.

We use the estimates of IFEE for six-digit HS products provided by Nicita, Olarreaga, and Silva (2018). As pointed out by Broda et al. (2008) and Nicita et al. (2018), elasticity measures are usually imprecisely estimated. Moreover, these elasticities are potentially affected by the existing tariffs and, thus, any regression of negotiated tariffs on IFEE may suffer from an endogeneity problem.[17] Another concern with the elasticity measure is the relatively low level of precision with which this continuous variable is estimated.

In order to address the potential endogeneity and imprecision of IFEE, Ludema and Mayda 2013 and Nicita et al. 2018 follow Broda et al. 2008 by turning IFEE into a categorical variable and by using instrumental variables. Similar to these works, we use a categorical variable that is equal to 1 for high values of IFEE and zero otherwise. Our results are robust to using a continuous IFEE measure or designating the top third, top half, and top tow-third of IFEE values as high market power. Moreover, as suggested by Nicita et al., we use the average import demand elasticities in the rest of the world to instrument for IFEE.[18] argue, in principle these two averages satisfy the exclusion restriction.

As alternative measures of IMP, we use import volume (as in Bagwell and Staiger 2011) and the share of a country in that product's world trade (as in BBR and Beshkar and Bond 2017). We use the log of these variables as well as a categorical variable that indicates high vs. low import volumes or shares. To address the endogeneity of trade volumes as a measure of IMP, we use log of GDP and the interaction of log of GDP per Capita and Product Differentiation Index as instrumental variables. GDP would naturally affect the volume of imports in a product without being significantly affected by tariffs in those products. Moreover, the interaction of GDP per Capita and Product Differentiation Index captures, in a rough way, the fact that richer countries tend to import relatively more in highly differentiated products.

Compared to IFEE, a drawback of import volume (and the corresponding world

[17] Soderbery (2015) also points out that these elasticity measures might overestimate the true level of export supply elasticity. Though it may be important for calculating gains from trade, overestimated elasticities do not introduce a major problem for our analysis as we rely on the ranking – rather than the size – of export supply elasticities.

[18] Estimates of import demand elasticity are obtained from Kee et al. (2008). In addition to the average import demand elasticities in the rest of the world, Nicita et al. also use as instrument a dummy variable for tariff bindings that are deemed too high to ever be binding, interacted with a measure of World Export Supply Elasticity. Since high tariff bindings can occur in our framework, we did not use this additional IV.

import shares) as a measure of IMP is that it suppresses the information about variation of supply elasticity across products. Nevertheless, in comparison to IFEE, it better captures the variation of IMP across countries in the same product category.[19] Therefore, the IMP measures based on trade volumes should provide a useful robustness check for our results.

Exporter Concentration Index (ECI)

LM suggest that a measure of exporter concentration for each product-country pair could be used to proxy for the degree of free-riding problem in tariff cut negotiations. Following LM, we calculate an Exporter Concentration Index akin to the Herfindahl-Hirschman Index for each HS six-digit product k imported to country i, namely,

$$ECI_{ik} = \frac{\sum_{j \in WTO_i} M_{jik}^2}{(\sum_{j \in MFN_i} M_{jik})^2}, \tag{7}$$

where, $M_{ji,k}$ is the volume of exports from country j to country i in product k, WTO_i is the set of all WTO members excluding i's FTA partners, and MFN_i is the set of all trading partners of importer i with an MFN status excluding i's FTA partners. In other words, WTO_i is the set of all countries that would have been able to enter negotiation with i for MFN tariff cuts, and MFN_i is the set of all countries that would benefit from MFN tariff cuts of country i.[20]

Trade data is obtained from UN Comtrade at the six-digit level for 1994, with trade data from 1995, 1996, 2000, 2006, and 2007 supplementing missing importer-product observations from 1994. Moreover, to construct the ECI measure for "new" WTO members (i.e., those who were not original members in 1995), we use trade data from 2000 instead of 1994 to better capture the trading patterns of these coun-

[19] The estimates of IFEE do not accurately capture the variation of IMP across countries. For example, in the estimates provided by Broda et al. (2008), the median IFEE for China is lower than that of Paraguay and Algeria, and in par with that of Bolivia and Ukraine. This comparison is very counter-intuitive given that China is a much larger economy. Therefore, IFEE estimates seem to capture more accurately the variation of IMP across products within each country.

[20] FTA members are defined as any country pair with an Economic Integration Agreement (EIA) classification number between 3 and 6, as calculated by Baier, Bergstrand, and Feng (2014). A value of 3 corresponds to an FTA, with higher values corresponding to a customs union, a common market, and an economic union. Following LM, we drop intra-Custom Union trade, e.g., trade between European Union members is dropped. As a robustness check FTA membership is amended to include PTAs, i.e., values of 1 or 2 in the EIA database. PTAs are either two-way agreements where tariffs are not fully eliminated, or a one-way preferential agreement, such as those involving GSP preferences.

Table 1: Correlations

	Tariff Binding	IMP (Top 2/3 IFEE)	IMP (Logged IFEE)	IMP (Logged Import Share)	ECI	PDI
IMP (Top 2/3 IFEE)	-0.144	1				
IMP (Logged IFEE)	-0.158	0.784	1			
IMP (Logged Import Share)	-0.252	0.301	0.333	1		
ECI	0.147	-0.077	-0.08	-0.43	1	
PDI	-0.067	0.006	0	0.03	-0.173	1
FTA Share/μ	0.009	-0.003	-0.003	0	-0.004	0

tries close to the time of their accession. For robustness check, in the appendix we also report regression results in which the ECI measure is calculated using only 1994 trade data for all countries.

Other Explanatory Variables

Product Differentiation Index Product differentiation Index—a binary variable provided by Rauch (1999)—is used by LM as their main measure of IMP. This choice is based on the argument that, other things equal, the residual supply of the foreign country is more elastic the more elastic is the foreign country's demand for the product. By construction, this measure does not vary across countries and does not capture the effect of import size or the elasticity of foreign supply on IMP. A major problem with using product differentiation as a measure of IMP is that this measure affects the optimal level of tariff directly through a channel that is distinct from IMP.

In models with politically motivated governments (as in Grossman and Helpman 1995), the optimal non-cooperative and cooperative tariffs are both decreasing in demand elasticity. This is essentially a Ramsey taxation argument: the consumption loss associated with an income transfer to the interest groups is higher in products with more elastic demand. Since higher product differentiation is associated with lower demand elasticity, the Ramsey taxation argument implies that the optimal tariff should be higher for differentiated products. Therefore, it is not justifiable to attribute the positive association between negotiated tariffs and product differentiation to the effect of ToT on trade agreements.

Political Stability We use the World Bank Governance Index, specifically the Political Stability and Absence of Violence measure, to control for country-specific political factors that may affect governments' preference for flexibility. The Governance Index is calculated by aggregating data on governments from a variety of sources including consumer and firm surveys and expert opinions. The construction of the index makes use of 35 data sources from 32 organizations. Our results are robust to various political stability measures provided by the World Bank and the Economist Intelligence Unit.

6 Evidence

To test the role of import market power and the free-riding problem in tariff cap negotiations, we estimate the following equation that is suggested by LM:

$$t_{ik}^{B} = \alpha + \beta_1 IMP_{ik} + \beta_2 IMP_{ik} * ECI_{ik} + \Gamma_{ik} + \varphi_i + \Psi_k + \epsilon_{ik}. \tag{8}$$

In this equation, i and k are importer and product indexes, respectively, t_{ik}^{B} is the tariff binding rate, IMP_i is a measure of import market power, and ECI_{ik} is the exporter concentration index. Other product and country-level variables are included in Γ_{ik}, φ_i, and Ψ_k. In all regressions, we include a two-digit industry dummy and either a country dummy or a country-level index of Political Stability. We also control for the effect of including ECI_{ik} and the ratio of within-FTA trade to import demand elasticity ($FTAShare_{ik}/\mu_{ik}$, as suggested by LM), and the Product Differentiation Index (PDI). Finally, we also run our regressions on various subsamples of countries including the original WTO members and the countries included in LM.[21]

[21] The list of countries in our study is provided in Table A.2.

Table 2: All Products – No IVs

	OLS						Tobit					
IMP (β_1; Top 2/3 IFEE)	-0.297***	-5.251***	-0.107	-6.271***	-6.368***	-6.379***	-0.304***	-6.157***	-0.00553	-7.470***	-7.440***	-7.451***
	(0.0989)	(1.146)	(0.300)	(1.731)	(1.710)	(1.709)	(0.103)	(1.386)	(0.330)	(2.078)	(2.051)	(2.050)
IMP × ECI (β_2)			-0.315	2.093	2.609*	2.632*			-0.526	2.581	3.025*	3.050*
			(0.464)	(1.506)	(1.539)	(1.537)			(0.527)	(1.748)	(1.780)	(1.779)
ECI			1.239*	6.121***	5.402**	8.085***			0.987	6.114***	5.472**	8.365***
			(0.649)	(2.157)	(2.208)	(2.115)			(0.690)	(2.309)	(2.362)	(2.286)
Pol Stability		-8.854***		-8.786***	-8.749***	-8.754***		-11.11***		-10.97***	-10.81***	-10.81***
		(1.734)		(1.748)	(1.726)	(1.726)		(2.073)		(2.081)	(2.041)	(2.040)
FTAShare/μ					0.0178	0.0180					0.0210	0.0212
					(0.0126)	(0.0127)					(0.0166)	(0.0167)
Prod Diff Index (PDI)					2.041***	4.464***					2.491***	5.097***
					(0.514)	(1.016)					(0.586)	(1.152)
PDI × ECI						-4.026***						-4.321***
						(1.460)						(1.621)
Constant	13.51***	30.48***	13.69***	27.43***	27.31***	25.35***	11.78***	27.44***	12.53***	24.98***	24.78***	22.66***
	(2.356)	(3.888)	(2.384)	(3.858)	(4.046)	(4.117)	(2.766)	(4.371)	(2.759)	(4.240)	(4.445)	(4.568)
Observations	131,810	131,550	129,236	128,976	102,449	102,449	131,810	131,550	129,236	128,976	102,449	102,449
Country FEs	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	No

[1] SEs clustered at Country level
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 fixed effects included in all estimations.

Proposition 1 states that the MFN-driven free-riding concerns and the flexibility-externality tradeoff have opposing effects on the relationship between import market power and negotiated tariffs. In particular, other things equal, the free-riding problem predicts a positive estimate for β_1, while the flexibility-externality tradeoff generally predicts a negative relationship. It is, therefore, an empirical question whether free-riding concerns or the flexibility-externality tradeoffs dominate in practice.

We begin by following LM in estimating Equation 8 on the entire sample of tariff lines. As reported in Tables 2-4, we find that the effect of import market power (IMP_{ik}) on negotiated tariff caps is negative—i.e., $\beta_1 < 0$. This result is robust to a variety of estimation methods (including OLS and Tobit) and whether we use Instrumental Variables or not. In these tables, we use the categorical variable "top two-third of IFEE" as our measure of IMP. As we discuss below, these results are robust to using alternative measures of IMP.

The magnitude of the effect of import market power on negotiated tariff caps is significant. For example, using the specification in Column 2 of Table 3, we find that increasing IFEE from the bottom third of the distribution to the top two-third of the distribution decreases the level of negotiated tariff cap by 25.9 percentage point on average.[22] Moreover, using the continuous measure of IFEE (Column 2;

[22] 95% confidence interval: [-15.6,-36.3].

Table 3: All Products – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-25.77***	-56.12***	-23.29***	-52.61***	-22.77***	-52.27***	-34.34**
	(8.784)	(9.032)	(8.147)	(8.803)	(8.028)	(8.701)	(13.58)
IMP $\times$ ECI (β_2)	35.96**	53.46***	30.24**	45.92***	30.16**	45.81***	47.03**
	(14.39)	(17.80)	(13.37)	(17.23)	(13.30)	(17.10)	(20.67)
ECI	-23.28**	-31.07***	-19.61**	-26.54**	-17.06**	-23.73**	-29.41**
	(9.323)	(11.47)	(8.660)	(11.30)	(8.231)	(10.92)	(13.49)
Pol Stability		-7.603***		-7.554***		-7.573***	
		(1.677)		(1.649)		(1.649)	
FTAShare/μ			0.00247	0.0128	0.00261	0.0130	0.00271
			(0.00190)	(0.0110)	(0.00194)	(0.0111)	(0.00744)
Prod Diff Index (PDI)			1.524***	2.827***	3.764***	5.247***	4.643***
			(0.472)	(0.577)	(0.725)	(0.956)	(1.094)
PDI $\times$ ECI					-3.763***	-4.039***	-4.428***
					(0.911)	(1.433)	(1.220)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	46.27	15.47	52.21	13.85	51.63	13.81	30.13
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

[1] SEs clustered at Country level
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 fixed effects included in all estimations.
[4] IMP is instrumented with ROW Import Demand Elasticity.

Table B.1 in the Appendix) we find that increasing $\ln(IFEE)$ from 25th percentile to the 75th percentile decreases the negotiated tariff cap by 13.6 percentage points.[23] These effects would be smaller but still significant if we use the corresponding OLS specifications without instrumental variables. [24] The larger estimates in IV regressions indicate that the negative relationship between negotiated tariffs and import market power is stronger when we rely only on the exogenous variation of IMP.

Recall that while a pure free-riding model predicts a positive estimate for β_1, a pure flexibility-externality model predicts a negative relationship. The negative estimates of β_1 imply that even if free-riding influenced tariff cut negotiations, its effects were dwarfed by the effect of a preference for flexibility in tariff obligations. However, a negative sign for β_1 does not reject the hypothesis that free-riding did in fact affect tariff negotiations. We now attempt to isolate the effect of free riding on negotiated tariffs.

[23] 95% confidence interval: [-8.3,-19.0]. All of these calculations are conducted holding ECI equal to its sample mean value.

[24] 5.5 and 3.6 percentage points, respectively.

Table 4: All Products – IV Tobit

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-27.80***	-67.77***	-24.57**	-62.12***	-24.02**	-61.76***	-36.39**
	(10.31)	(10.36)	(9.564)	(10.22)	(9.438)	(10.13)	(15.91)
IMP × ECI (β_2)	35.66**	60.14***	27.67*	48.99**	27.59*	48.91**	46.59**
	(16.43)	(20.12)	(15.32)	(19.68)	(15.23)	(19.55)	(23.38)
ECI	-23.57**	-36.17***	-18.27*	-29.16**	-15.66*	-26.19**	-29.30*
	(10.65)	(12.97)	(9.949)	(12.91)	(9.492)	(12.48)	(15.41)
Pol Stability		-9.424***		-9.273***		-9.292***	
		(1.906)		(1.864)		(1.864)	
FTAShare/μ			0.00319	0.0146	0.00336	0.0148	0.0584
			(0.00321)	(0.0143)	(0.00326)	(0.0144)	(0.0374)
Prod Diff Index (PDI)			1.905***	3.553***	4.183***	6.116***	5.394***
			(0.548)	(0.669)	(0.841)	(1.099)	(1.285)
PDI × ECI					-3.820***	-4.269***	-4.826***
					(1.016)	(1.579)	(1.421)
Constant	32.49***	68.80***	28.72***	63.42***	26.62***	61.08***	55.80***
	(8.530)	(9.228)	(8.014)	(9.348)	(7.701)	(9.196)	(12.79)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Wald Exogeniety p-value	0.0054	0.0000	0.0046	0.0000	0.006	0.0000	0.0112

[1] SEs clustered at Country level
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 fixed effects included in all estimations.
[4] IMP is instrumented with ROW Import Demand Elasticity.

6.1 Isolating the Effect of Free Riding

To isolate the effect of free-riding, we follow two strategies. First, as argued by LM, if free-riding problem did affect the negotiations then the coefficient of the interaction between IMP and ECI must be negative: The more concentrated are foreign exporters (i.e., higher ECI) the lower is the free-riding problem and, thus, the larger is the negative impact of IMP on negotiated bindings.[25] As reported in Tables 2-4, however, the estimates of β_2 are generally non-negative and, thus, we cannot find evidence supporting the free-riding theory.[26]

[25]In other words, as pointed out in Proposition 1, the free-riding problem is expected to be more severe for products in which exporters are spread across more countries. In Proposition 1, we confirm that this result continues to hold if we introduce a flexibility-externality tradeoff to the LM model.

[26]In many of our specifications, the estimated coefficient of ECI is negative. However, these estimates are smaller than β_2, implying that the effect of ECI on negotiated binding rates is negative only if IMP is (sufficiently) low. In some other specifications, such as OLS estimates reported in Table 2 and whenever continuous measures of IMP and ECI are used, ECI coefficients are positive or zero. Therefore, we are unable to establish a negative causal relationship between ECI and negotiated tariffs.

A second way to isolate the effect of free riding is to evaluate the pattern of negotiated tariffs in a subsample of tariff lines in which flexibility-externality tradeoffs are not present, implying that the relationship between negotiated tariffs and IMP is only affected by free-riding. According to Proposition 2, the subsample strongly-bound tariff lines satisfy this condition. In particular, it is not optimal to provide any flexibility in obligations in tariff lines with a sufficiently high IMP. Therefore, for tariff lines with sufficiently high IMP, the relationship between the level of negotiated tariffs in equilibrium and IMP is affected only by the free-riding problem.

To be more precise, note that as depicted in Figure 1, the effect of IMP on the negotiated tariff caps is non-monotonic only at the presence of an MFN-driven free-riding problem. (Compare the solid and dashed graphs in Figure 1, which represent cases with and without free riding, respectively.) In particular, at the presence of free-riding, there is a threshold of IMP below (above) which the negotiated tariff cap is decreasing (increasing) in IMP.

In taking the above non-monotonicity result to data we face an obstacle: It is impractical to empirically determine the critical threshold of IMP because this threshold depends on various product-specific parameters that are unobservable to us. However, our theory suggests an alternative empirical strategy that does not require determining this threshold. To see this, note that for values of IMP below this threshold, the negotiated tariff caps are *weakly binding*, meaning that under some states of the world, the importing country finds it optimal to choose a tariff below the cap, thereby generating a *tariff overhang*. For values of IMP above this threshold, however, the negotiated caps are *strongly binding*, namely, the importing country will find the negotiated cap restrictive under all states of the world and, hence, no tariff overhang is ever observed.

The availability of applied tariff data for more than two decades enables us to designate the binding status of each product as strong or weak, depending on whether a tariff overhang has ever been observed in a given import product of a country. This categorization of tariff caps into weak and strong, which approximates the binding status that is defined in our theory, allows us to test the non-monotonic prediction of the model. As reported in Table 5, the likelihood of a strong binding is increasing in IMP as predicted by the model.

Tables 6-7 provide Tobit estimation results (with and without IVs) on the sample

Table 5: Binding Status and Import Market Power

	Top 2/3 IFEE	Top 1/2 IFEE	Top 1/3 IFEE	ln(IFEE)	ln(Import Share)	ln(Total Imports)
Prob. of Strong Binding	0.432***	0.414***	0.373***	0.106***	0.0749**	0.0745***
	(0.124)	(0.122)	(0.112)	(0.0297)	(0.0297)	(0.0250)
Observations	131,648	131,648	131,648	131,648	335,315	335,315

Note: This table reports the result of a Probit regression of binding status (=1 if strong binding) on different measures of IMP.

of strongly-bound tariff lines.[27] The estimates of β_1 reported in Tables 6-7, however, are not different from zero for this subsample. As reported in Appendix B, the non-positive estimate of β_1 on the sample of strongly-bound industries is robust to using alternative measures of IMP. Finally, the estimates of β_2 are not statistically different from zero, thus generating no evidence of free riding. Hence, we conclude that the relationship between IMP and negotiated tariffs does not become positive even for tariff lines with high IMP. This observation casts further doubts on the relevance of MFN-driven free-riding in tariff cut negotiations.[28]

The estimation of Equation 8 on the subsample of weakly-bound tariff lines indicate that $\beta_1 < 0$, i.e., the effect of import market power (IMP_{ik}) on negotiated tariffs is negative and significant (Table 8). The negative relationship between negotiated tariffs and import market power once again lends support to the theoretical finding that under an optimal agreement *products with a greater* ToT *externality will be given a smaller degree of trade policy flexibility.* To interpret the negative sign of β_1 on the sample of the weakly-bound tariff lines, note that there are two opposite forces that determine the sign and size of β_1 : The MFN-driven free-riding theory that predicts a positive β_1, and the flexibility-commitment theory predicts a positive β_1 for weakly-bound tariff lines and $\beta_1 = 0$ for strongly-bound tariff lines. The negative sign of β_1 suggests that the flexibility-commitment trade off dominates the free-riding effects for weakly-bound tariff lines.

[27] A Tobit regression is the appropriate specification to use here since the subsample of strongly-bound tariff lines include products with a zero tariff binding.

[28] The last columns of Tables 6-7 report the results for the subsample of tariff lines with positive tariff binding rates. This exercise confirms that the results are not driven by tariff lines that are bound as zero.

Table 6: Strong Binding Products – Tobit

	All Countries						LM Countries	Binding > 0
IMP (β_1; Top 2/3 IFEE)	-1.155*	0.910	-1.107	0.934	-1.109	0.951	-1.414	-1.567**
	(0.680)	(1.384)	(0.786)	(1.422)	(0.777)	(1.435)	(1.393)	(0.727)
IMP x ECI (β_2)	0.747	-3.184**	0.675	-3.215*	0.692	-3.249*	1.066	1.388
	(1.039)	(1.589)	(1.251)	(1.718)	(1.234)	(1.741)	(2.199)	(1.297)
ECI	-0.971	4.711	-0.464	4.810*	0.486	3.261	1.096	0.452
	(1.305)	(2.890)	(1.474)	(2.848)	(2.018)	(2.391)	(3.119)	(1.792)
Pol Stability		-8.937***		-9.069***		-9.045***		
		(1.529)		(1.527)		(1.521)		
FTAShare/μ			0.0330	0.155	0.0332	0.154	0.0179	0.00347
			(0.0377)	(0.177)	(0.0374)	(0.177)	(0.0166)	(0.0183)
Prod Diff Index (PDI)			1.595***	2.399***	2.379**	1.125	3.494**	1.798**
			(0.611)	(0.759)	(1.100)	(1.365)	(1.541)	(0.813)
PDI x ECI					-1.459	2.328	-4.228*	-0.616
					(1.800)	(2.736)	(2.541)	(1.527)
Observations	31,738	31,738	25,022	25,022	25,022	25,022	16,522	13,250
Country FEs	Yes	No	Yes	No	Yes	No	Yes	Yes

[1] SEs clustered at Country level
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 dummies included in all estimations.
[4] The final column is estimated using OLS on the subsample of strongly-bound products where the bound tariff is greater than zero.

Table 7: Strong Binding Products – IV Tobit

	All Countries						LM Countries	Binding > 0
IMP (β_1; Top 2/3 IFEE)	-7.541	18.42	-11.07	13.85	-11.10	14.04	-18.52*	-6.406
	(8.076)	(14.14)	(7.771)	(13.47)	(7.788)	(13.53)	(10.69)	(7.204)
IMP $\times$ ECI (β_2)	-7.416	-22.67	-8.086	-17.98	-8.043	-18.28	-3.806	-6.580
	(15.51)	(20.74)	(15.55)	(18.72)	(15.51)	(18.84)	(20.25)	(16.23)
ECI	4.693	21.09	5.375	17.12	5.580	15.66	2.757	5.503
	(11.91)	(16.83)	(12.05)	(15.14)	(12.13)	(14.91)	(16.74)	(13.18)
Pol Stability		-9.503***		-9.498***		-9.475***		
		(1.733)		(1.728)		(1.718)		
FTAShare/μ			0.0273	0.163	0.0275	0.161	0.0135	0.0364
			(0.0290)	(0.181)	(0.0289)	(0.181)	(0.0149)	(0.0245)
Prod Diff Index (PDI)			2.458***	2.216**	2.607**	0.839	3.749***	2.071***
			(0.744)	(0.876)	(1.061)	(1.545)	(1.381)	(0.769)
PDI $\times$ ECI					-0.311	2.512	-2.660	0.184
					(1.349)	(2.668)	(1.656)	(1.218)
Observations	31,620	31,620	25,022	25,022	25,022	25,022	16,522	13,250
Country FEs	Yes	No	Yes	No	Yes	No	Yes	Yes
Wald Exogeniety p-value	0.308	0.348	0.00945	0.540	0.0093	0.532	0.0340	N/A: OLS

[1] SEs clustered at Country level
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 fixed effects included in all estimations.
[4] IMP is instrumented with ROW Import Demand Elasticity.
[5] The final column is estimated using IV OLS on the subsample of strongly-bound products where the bound tariff is greater than zero.

We perform an extensive set of robustness checks, the results of which are included the Appendix. Most importantly, in Appendix B, we show that the results are robust to using different measures of IMP, including categorical variables for IFEE constructed with different thresholds, a continuous IFEE, import shares, and import volumes. We also show the robustness of our results to using a different measure of tariff binding (Appendix C) and to using data from a different year to construct our measure of Exporter Concentration Index (Appendix D.)

Table 8: Weak Binding Products – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-38.63***	-50.53***	-34.26***	-47.43***	-33.12***	-46.49***	-53.63***
	(12.60)	(12.69)	(12.34)	(13.97)	(12.11)	(13.83)	(18.55)
IMP × ECI (β_2)	65.27***	65.30***	59.40***	60.11**	58.81***	59.38**	88.35***
	(22.32)	(20.64)	(21.97)	(23.30)	(21.79)	(23.14)	(30.60)
ECI	-40.35***	-35.01***	-37.09***	-32.52**	-33.79**	-29.58**	-54.15***
	(14.05)	(12.86)	(13.83)	(14.65)	(13.26)	(14.35)	(19.70)
Pol Stability		-5.884***		-5.909***		-5.921***	
		(1.902)		(1.874)		(1.878)	
FTAShare/μ			0.00398	0.0145	0.00419	0.0148	0.0717
			(0.00290)	(0.0117)	(0.00297)	(0.0118)	(0.0564)
Prod Diff Index (PDI)			1.298**	2.230***	3.931***	4.418***	5.212***
			(0.578)	(0.652)	(0.883)	(1.199)	(1.344)
PDI × ECI					-4.328***	-3.577**	-5.194***
					(1.079)	(1.617)	(1.489)
Observations	97,064	96,805	77,487	77,292	77,487	77,292	43,291
Country Dummy	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	44.33	25.32	47.76	46.35	47.37	46.90	15.72
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004

[1] SEs clustered at Country level
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 fixed effects included in all estimations.
[4] IMP is instrumented with ROW Import Demand Elasticity.

6.2 Evidence for the Ramsey Taxation Argument

We confirm the main estimation results of LM that negotiated tariffs are increasing in the Product Differentiation Index (PDI). However, based on our model, we offer a different interpretation of this relationship. As reported in Tables 2-4, the estimates for PDI are positive and statistically significant across various specifications and country samples. This relationship continues to hold for the subsamples of strongly-bound and weakly-bound tariff lines (Tables 7 and 8).

We argue that the finding that tariffs are increasing in the degree of product differentiation reveals the role of Ramsey Taxation, rather than ToT effects, in trade agreements. To see this, note that the degree of product differentiation is a direct measure of *demand elasticity* such that products with a lower degree of differentiation have a higher demand elasticity. Moreover, efficiently-negotiated tariffs are lower in products with a more elastic demand. This result reflects a simple Ramsey Taxation argument in political-economy trade models: in products with a higher demand elasticity, it is more costly for the government to transfer welfare to industries by protecting them against import competition.[29] Therefore, the estimated positive sign of the coefficient of PDI in our regressions is likely to reflect the relatively lower political cost of applying higher tariffs on products with a lower demand elasticity.

6.3 Free Trade Agreements

There is an extensive literature that studies the effect of FTA membership on a country's unilaterally-optimal tariff on nonmembers. In particular, theoretically, membership in an FTA could reduce the level of a country's optimal tariff on nonmembers—a phenomenon known as FTA tariff complementarity. However, neither the past literature nor the present paper specifically consider the effect of FTAs on *negotiated MFN tariff* caps. This left us with little guidance on how to control for the potential effects of FTAs in our empirical analysis. As in LM, our approach in addressing this issue was to control for the share of imports from FTA partners, $FTAShare$, in our regressions.[30] Moreover, we followed LM by excluding exports from FTA members in calculating our Exporter Concentration Index. None of these controls had a significant impact on our parameter of interest, namely, the effect of import market power on the level of negotiated tariff caps.

To make sure that our empirical results are not driven by FTAs, we need to understand whether FTA membership could explain the negative relationship between negotiated tariff caps and import market power. Theoretically, the effect of pre-WTO FTAs on negotiated MFN tariff caps is ambiguous: On one hand, a preexisting FTA increases the negative externality of a given level of tariffs on non-FTA members. On the other hand, due to FTA tariff complementarity, an FTA member

[29] See the end of Section 4 for a discussion of this result.

[30] Similar to LM, we have reported regressions that include $FTAShare/\mu$. The results continue to hold if we instead include $FTAShare$; see the first two columns in Table E.1

has a weaker incentive to impose tariffs on non-FTA members. While the former effect tends to decrease the optimal tariff cap rate to reduce the externality of tariffs, the latter effect tends to increase the the tariff cap rate to provide more flexibility. As a result, we think that pre-WTO FTAs have an ambiguous effect on the relationship between MFN binding and import market power.

Now consider the effect of FTAs that went into effect after the WTO was established in 1995. Because the introduction of a new FTA does not affect the existing MFN tariff caps, our baseline analysis of tariff caps are unaffected by new FTAs. Nevertheless, our analysis of *weak* bindings may be affected by the introduction of new FTAs. That is because tariff complementarity may induce FTA partners to reduce their *applied* MFN tariffs on some products, thereby expanding the set of weakly-bound products.

To make sure that the potential expansion in the set of weakly bound tariff lines does not derive our result, we also use a definition of weak binding that relies on applied tariffs that were adopted before the formation of new FTAs. We confirm that our results continue to hold. (See the last four columns of Table E.1 in the Appendix.) Moreover, from a theoretical standpoint, if the formation of an FTA causes the status of a tariff line to switch from strong binding to weak binding, then it would more difficult to find a negative relationship in the data between negotiated bindings and IMP in the subsample of weakly-bound tariff lines.[31] But we still find a strongly negative relationship between binding and IMP for weakly-bound tariff lines. Therefore, our qualitative interpretation of the data is not affected by the existence of tariff complementarity.

6.4 Political Influence of Exporting Firms

We worked within a theoretical framework in which the profits of import-competing firms may have a higher weight compared to consumer surplus in the governments' objective functions. What if we assume that governments also care more about the profits of exporting firms than consumer surplus? As noted by Nicita, Olarreaga, and Silva (2018), under this assumption, efficiently-negotiated tariffs would be decreasing in the import market power of importing countries.

The comparison between the flexibility theory of tariff caps and Nicita et al.'s theory of "cooperation in tariff water" deserves a more in-depth analysis that is

[31] To see this, recall that the slope of the regression line is flatter when strongly-bound tariff lines are also included in the regression of binding on IMP.

beyond the scope of this paper. To be sure, while in this paper we focus on explaining tariff cap rates, Nicita et al.'s main focus is on the behavior of applied tariffs in weakly-bound tariff lines. However, we can make a couple of observations in this regard.

First, given the substantial tariff overhangs observed in the WTO, the negotiated tariff caps cannot be understood as jointly-efficient tariffs. That is because if tariff caps were jointly-efficient tariffs, applied tariffs would have been always equal to tariff caps and, thus, no tariff overhang would be observed. Therefore, the negative relationship that we observe between negotiated tariff caps and measures of IMP cannot be explained by the political influence of exporting firms on negotiations.

Moreover, Nicita et al.'s model predicts no relationship between tariff binding rates and IMP at the presence of tariff overhang. That is because they assume that tariff overhang occurs in tariff lines in which the importing countries were given the discretion to bind their tariffs at an arbitrarily high rate. To address this concern more directly, we run our regressions on the subsample of developed countries and find similar results (Table 9).

Table 9: Developed Countries – IV OLS

	All Products					
IMP (β_1; Top 2/3 IFEE)	-17.49***	-36.81***	-15.38**	-33.91***	-15.16**	-33.93***
	(6.090)	(8.347)	(6.189)	(8.109)	(6.170)	(8.100)
IMP x ECI (β_2)	47.65**	28.19	32.37*	24.60	32.74*	24.94
	(20.50)	(21.33)	(16.78)	(20.02)	(16.85)	(20.02)
ECI	-34.37**	-20.71	-23.07*	-17.96	-20.50*	-15.42
	(14.70)	(15.45)	(12.11)	(14.51)	(11.83)	(14.21)
Pol Stability		-3.503***		-3.521***		-3.531***
		(0.259)		(0.253)		(0.254)
FTAShare/μ			0.0110	0.0333*	0.0113	0.0337*
			(0.00896)	(0.0183)	(0.00979)	(0.0188)
Prod Diff Index (PDI)			0.791	2.669***	3.268***	5.116***
			(0.599)	(0.551)	(0.637)	(0.726)
PDI x ECI					-4.417***	-4.335***
					(1.096)	(1.199)
Observations	46,200	46,201	36,887	36,888	36,887	36,888
Country Dummy	Yes	No	Yes	No	Yes	No
Weak Instrument F-Stat	7.31	13.71	12.25	15.08	12.08	14.98
Underid p	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000

[1] SEs are robust as number of country clusters is less than 25
[2] *** p<0.01, ** p<0.05, * p<0.1
[3] HS2 dummies included in all estimations.
[4] IMP is instrumented with ROW Import Demand Elasticity.

In summary, introducing political shocks to the preferences of exporting governments does not overturn our theoretical finding result that tariff bindings are negatively related to IMP. More importantly, the key feature of our model—namely, uncertain political economy shocks to the preferences of importing countries—remains critical in explaining the relationship that we observe empirically between tariff caps and IMP at the presence of tariff overhang.

7 Predicting Unilaterally-Optimal Tariffs: A Back-Of-The-Envelope Calculation

A key step in evaluating the impact of trade agreements is to predict the unilaterally-optimal tariffs, i.e., tariff rates that would be adopted if the agreement were not in place. To calculate the optimal tariffs under a terms-of-trade framework, in addition to a measure of export supply elasticity, we would need a measure of political weights of each country-industry pair. However, no direct measure of political weights is readily available.

The tariff overhang model that we used in this paper provides clear directions for uncovering the political parameters from the variation in negotiated and applied tariffs under the WTO. A drawback of this model for calibrating political economy shocks is its partial equilibrium nature. A more rigorous approach would be to rewrite the tariff overhang model within a general equilibrium framework such as the one used by Ossa (2014). However, we think that the main insights of the model regarding the relationship between political parameters and observed applied and negotiated tariffs can be readily presented using our partial equilibrium framework. That is our objective in this subsection.

Ossa (2014) calibrates political economy weights in his model based on the variation in non-cooperative tariffs across industries whenever that data is available. In particular, he first calculates optimal tariffs assuming that all industries have the same political weight. He then calibrates the political weights to match the distribution of the implied optimal tariffs to that of observed non-cooperative tariffs. He is able to conduct this calibration exercise for a few countries that have data on tariff rates that they apply on imports from non-WTO members.

As correctly pointed out by Ossa (2014, p. 4117), it is unreasonable to assume that the variation in the factual tariffs reflects the variation in political economy weights across industries because "factual tariffs are the result of complex and unfinished trade negotiations so that their relationship to optimal tariffs is far from clear." In light of the tariff overhang model, however, the factual tariff rates under the WTO embody a wealth of information about the import market power and the political weights of different industries. We now show how the tariff overhang model could be used to uncover that information.

To begin, note that the unilaterally optimal tariff may be written as:[32]

$$t_{ij}^N = \frac{\omega + \frac{\theta}{\eta}}{1 - \frac{\theta}{\eta}}.$$

Therefore, given that we have an estimate of ω, the additional information we need to calculate optimal tariffs is an estimate of the distribution of $\Theta \equiv \frac{\theta}{\eta}$ for each sector. Moreover, because θ appears in all of our formula in interaction with $1/\eta$, we only

[32]See Equation 3.

Table 10: Predicted Optimal Tariffs

Rank*	Country	Median Predicted Politically-Optimal Tariff	Median Predicted Non-Political Optimal Tariff	Median Tariff Binding Rate
1	Bangladesh	73	7	200
2	USA	64	60	2
4	Zimbabwe	57	6	150
10	European Union	52	46	3
20	Mexico	39	17	35
21	India	39	11	40
28	Brazil	35	13	35
36	China	33	21	8
37	Argentina	32	11	35
38	Thailand	31	12	30
39	Indonesia	31	11	40
43	Turkey	29	15	16
44	South Africa	29	12	15
45	Rep. of Korea	28	16	13
46	Uruguay	28	5	35
47	Peru	27	8	30
48	Sri Lanka	27	7	10
53	Malaysia	26	13	13
59	Japan	25	21	0
61	Australia	25	15	10
62	Canada	24	20	5
65	Bahrain	24	6	35
81	Norway	16	14	3
86	Georgia	8	3	7

*Countries are ranked based on the median of their predicted politically-optimal tariffs.

need to calibrate Θ rather than θ and η separately. The parameter Θ embodies not only political weight that the government assigns to an industry, but also the cost of transferring wealth from consumers to producers in that industry, which is captured by $\eta = \epsilon\frac{m}{s}$.

We calibrate the overhang model to obtain the range of Θ as well as its average, which we denote with $\tilde{\Theta}$. To this end, let's assume that the political parameter, θ, is uniformly distributed over the range $[\underline{\theta},\bar{\theta}]$, and that $\varphi = 1$. The First-Order Condition (5) at an interior solution may then be written as

$$\bar{\Theta} \equiv \frac{\bar{\theta}}{\eta} = \frac{t_B + \omega}{1 + t_B}. \tag{9}$$

Given the availability of tariff binding data and estimates of ω, we can use the above equation to back out $\bar{\Theta}$.

We now turn to estimating the minimum value of Θ, namely, $\underline{\Theta} \equiv \frac{\underline{\theta}}{\eta}$, for weakly-bound industries. The information on applied tariffs could be used to calculate only an *upper bound* for the minimum value of the political weight in the case of weakly-bound tariff lines. In particular, if a tariff line has a positive overhang, the applied tariff reflects the unilaterally-optimal tariff under the current political-economy conditions. Equation (3) for unilaterally-optimal tariffs implies that the *prevailing* political-economy weight must be $\Theta \equiv \frac{\theta}{\eta} = \frac{t^N - \omega}{1+t^N}$. Therefore, feeding the lowest observed applied tariff during our sample period, denoted as $\min(t_A)$, as t^N to the above equation, we can obtain an *upper bound* for the minimum value of our political-economy parameter in the case of weakly-bound tariff lines:

$$\underline{\Theta} = \frac{\min(t_A) - \omega}{1 + \min(t_A)}. \tag{10}$$

A corner solution arises iff $\underline{\Theta} \geq \frac{t_B - \omega}{1+t_B}$, in which case the tariff line is predicted to be strongly bound. Therefore, this inequality defines an upper bound on the lowest level of our political-economy parameter in case of a strong binding. Moreover, at a corner solution the optimal level of tariff cap is given by

$$t_B = \frac{E[\theta]}{\eta - E[\theta]}.$$

Noting that $E[\theta] = \frac{\bar{\theta}+\underline{\theta}}{2}$, solving for $\tilde{\Theta} \equiv \frac{E[\theta]}{\eta}$ yields

$$\tilde{\Theta} = \frac{t_B}{1 + t_B}. \tag{11}$$

Finally, assuming $\underline{\Theta} = \frac{t_B - \omega}{1+t_B}$, we can use 11 to estimate a *lower bound* for $\bar{\Theta}$ as follows:

$$\bar{\Theta} = \frac{t_B + \omega}{1 + t_B}.$$

This expression is identical to the one obtained for weakly-bound industries–i.e., at an interior solution. However, in interpreting the counterfactual results, it is worth bearing in mind that for the case of strongly-bound sectors, $\bar{\Theta} = \frac{t_B+\omega}{1+t_B}$ is only a *lower bound* for the maximum value of political weight. Our methodology, therefore, provides a relatively more accurate estimate of the range of political weights in the case of weakly-bound tariff lines.

We now use the calibrated values of $\bar{\Theta}$ and $\underline{\Theta}$ together with estimated values of ω to predict optimal tariffs, namely, tariffs that would be applied in a counterfactual scenario with no tariff binding commitments.[33] Table 10 provides the median

[33]Some of the estimates of inverse export supply elasticity imply optimal tariffs of several thou-

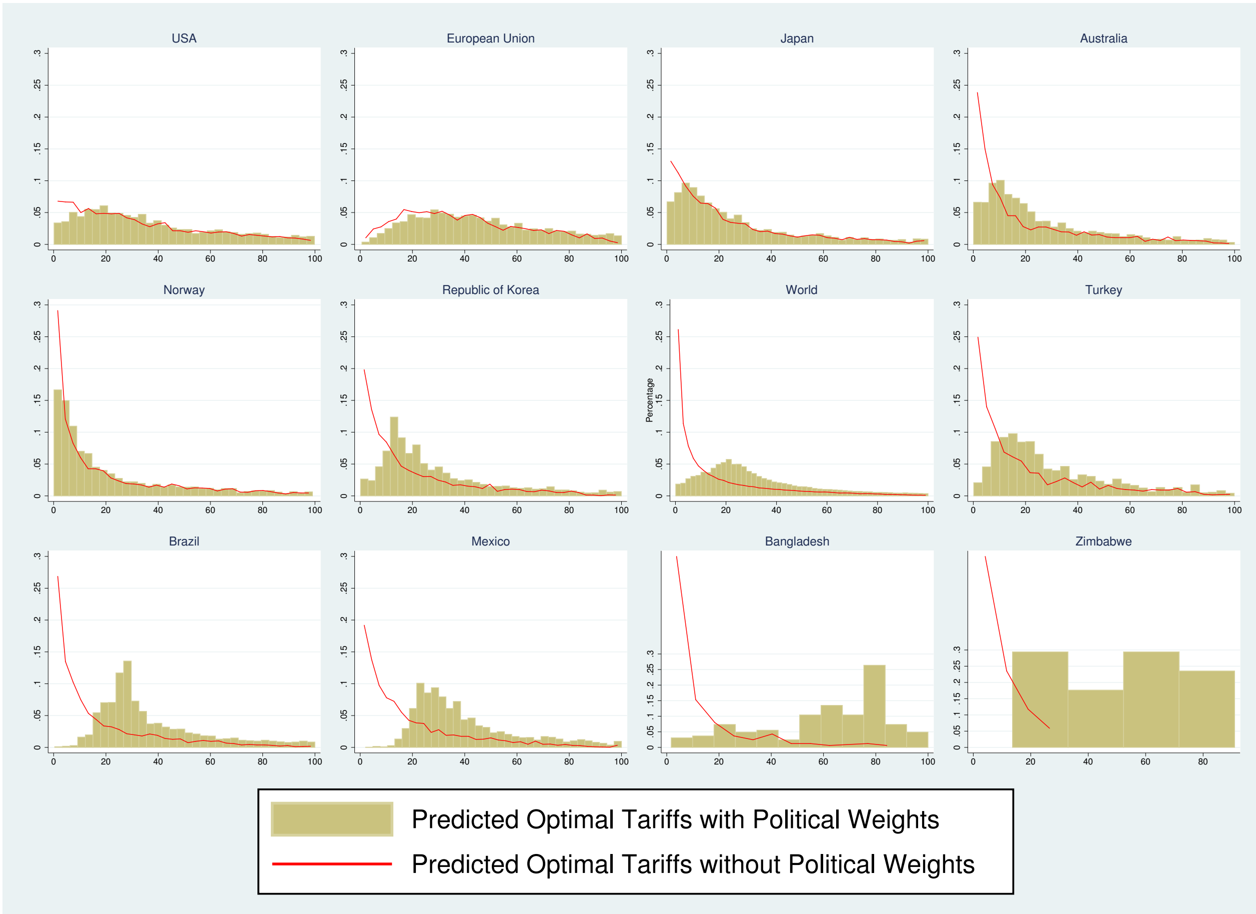

Figure 4: Predicted Optimal Tariffs with and without political weights

Note: The histograms are drawn for tariff cap rates below 100%.

of the predicted optimal tariffs for various countries in our sample. The median optimal tariffs for countries range from 8% for Georgia to 73% for Bangladesh. The United States has the second highest median optimal tariffs at 64%. The large estimates of optimal tariff for many small and developing countries with low import market power reflects the strength of political motives in trade policy making in those countries.

The importance of politics in the variation of optimal tariffs across industries is substantially different across countries. For example, in the absence of political weights, the median optimal tariff for Bangladesh is 7%, which is an order of

sand percents, which substantially inflates the level of *average* predicted tariffs. We believe these outliers are the product of measurement errors. We thus report *median* of predicted tariffs that are less sensitive to the existence of these outliers.

magnitude smaller than the median of its politically-optimal tariffs. For the United States and European Union, however, the difference between political and non-political optimal tariffs are much smaller.

In addition to the general level of optimal tariffs in a country, political considerations seem to be an important factor in the variation of optimal tariffs across industries. This is shown in the histograms in Figure 4 that depict the distribution of estimated optimal tariffs at the industry level with and without political weights for various countries. As expected, compared to the distribution of non-political optimal tariffs, the distribution of politically-optimal tariffs are more skewed to the right. These histograms give a general sense about the relative importance of politics and import market power in the determination of optimal tariffs for each country. Generally speaking, it appears that politics plays a more important role in determining the level of optimal tariffs in developing countries.[34]

The above calculations put much faith not only in the validity of our partial-equilibrium model, but also in the precision and accuracy with which the elasticity measures are estimated. Nevertheless, by presenting the above *back-of-the-envelope* calculations we hope to highlight the wealth of information that may be inferred about the political economy of trade policy from the variation of applied and negotiated tariff rates across industries and countries.

8 Conclusion

This paper aims to reconcile conflicting results in the literature concerning how import market power matters for tariff negotiations. As articulated by Bagwell and Staiger (1999) and Grossman and Helpman (1995), the first-best trade agreements eliminate the ability of the governments to use their import market power to manipulate their terms of trade. Various empirical studies, including Ludema and Mayda (2013), Beshkar et al. (2015); Beshkar and Bond (2017), and Nicita et al. (2018), show that the real-world trade agreements deviate from this predicted first-best. However, these papers generate conflicting views about why the first-best is

[34]In a recent paper, Irwin and Soderbery (2021) propose an empirical framework to decompose the role of politics and import market power in the choice of Smoot-Hawley tariffs in the United States. To capture the role of politics, they rely on the variation of lobbying activities across industries during that time period in the United States. One could expand Irwin and Soderbery's analysis to other countries by using our calibrated political parameters, which may be calculated for all WTO members.

not achieved in negotiations and how the import market power of different member countries shaped the existing trade agreements.

In this paper we design and test a model that takes into account the uncertainty about future political-economy preferences and the MFN-driven free-riding problem in tariff negotiations. We predict that if there is significant uncertainty about future political-economy preferences, governments tend to negotiate lower tariffs for products with larger import market power. Conversely, if the free-riding problem is a major factor in trade negotiations, tariffs tend to be larger in products with a greater import market power.

Testing this model using data on negotiated tariff bindings in the WTO, we find overwhelming support for the view that uncertainty about future political-economy preferences have shaped the WTO agreement on tariffs. The observed pattern of tariff commitments, however, are inconsistent with the prediction of a model featuring MFN-driven free-riding problems. In particular, we find that negotiated tariffs are inversely related to the degree of importing country's market power in a product. This relationship reflects an important tradeoff that parties to a trade agreement face: while a more stringent tariff binding reduces the negative externality of unilateral tariffs, it reduces the governments' ability to respond to uncertain political-economy shocks. Therefore, the weaker is a government's import market power in a particular industry, the higher is the net value of discretion over trade policy.

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Appendix

A Data sources and the list of countries

Table A.1: Data Sources

Data Source	Variable Name(s)	Description
UN Comtrade		Database of official international trade statistics
	Importer (iso3_d)	Importing Country
	Exporter (iso3_o)	Exporting Country
	Year (period)	Year of Trade
	Product (SixDigitHS)	6-digit HS 88/92 (Revision 0) Product Code
	Trade Volume (tradevalue)	CIF value in US Dollars of Imports; used to create ECI, FTA Share
Economic Integration Agreements		
	EIA	Denotes Level of Economic Integration
Rauch Product Classification		
	Product (sitc4)	4-digit SITC Revision 2 Product Code
	Liberal Classification (lib)	=n if differentiated good, =w if homogenous good; liberal aggregation
	Conservative Classification (con)	=n if differentiated good, =w if homogenous good; conservative aggregation
World Bank Open Data		
	NY.GDP.MKTP.CD	GDP Current USD
	NY.GDP.PCAP.CD	GDP per Capita Current USD
World Bank Governance Index		Governance indicators for over 200 countries
	Political Stability No Violence	Political Stability and Absense of Violence
	Government Effectiveness	Government Effectiveness
	Control of Corruption	Control of Corruption
	Regulatory Quality	Regulatory Quality
Nicita et al. (2018)		Estimated Elasticities
	Market Power	Inverse Foreign Export Supply Elasticity
	ROW Import Demand Elas	Rest of World Import Demand Elasticity
	Imp Demand Elas	Import Demand Elasticity
World Bank WITS - TRAINS		Database of official tariffs
	Tariff Binding (BND)	WTO-negotiated tariff cap (both simple and weighted averages)
	Applied Tariff (MFN)	Applied WTO MFN tariff (both simple and weighted averages)

Table A.2: The List of Countries Included in the Study

Antigua and Barbuda	Dominica*	Malaysia*	Senegal
Argentina*	Egypt	Mali	Singapore
Australia*	El Salvador	Mauritius*	South Africa
Bahrain	European Union*	Mexico*	South Korea*
Bangladesh	Gabon*	Mongolia	Sri Lanka*
Barbados	Georgia	Morocco*	Swaziland
Belize*	Ghana	Namibia	Tanzania
Benin	Grenada*	New Zealand*	Thailand*
Bolivia*	Guatemala*	Nicaragua*	Togo
Botswana	Guyana	Niger	Trinidad and Tobago
Brazil*	Honduras	Nigeria	Tunisia*
Brunei Darussalam	Hong Kong	Norway*	Turkey
Burkina Faso	Iceland*	Oman	Uganda
Burundi	India*	Panama	United Arab Emirates
Cameroon	Indonesia*	Papua New Guinea	Uruguay
Canada*	Israel	Paraguay	USA*
Central African Rep.	Jamaica	Peru*	Venezuela
Chile*	Japan*	Philippines	Zambia
China	Jordan	Rwanda	Zimbabwe
Colombia*	Kenya	Saint Kitts and Nevis*	
Costa Rica	Madagascar*	Saint Lucia	
Cote d'Ivoire	Malawi	Saudi Arabia	

[*] Countries studied by LM.

B Robustness to using alternative measures of Import Market Power

As our primary measure of import market power, we used a binary variable that indicated whether a product's Inverse of Foreign Export Supply Elasticity (IFEE) was in the top 2/3 of the sample. In this section of the appendix, we show that our results are robust to alternative measures of import market power, including different thresholds for designating IFEE as high (Top 1/2 and top 1/3 of the sample), a continuous variable, $ln(IFEE)$, a country's world import share, and total import in a product.

B.1 IMP: Natural Log of IFEE

Tables B.1–B.4 replicated Tables 3–4 and 7–8 using $ln(IFEE)$ as the measure of import market power.

Table B.1: Full Sample – IV OLS

	All Countries						LM Countries
IMP (β_1; ln(IFEE))	-4.766***	-10.52***	-4.299***	-9.903***	-4.214***	-9.844***	-5.877**
	(1.685)	(1.949)	(1.567)	(1.887)	(1.543)	(1.867)	(2.428)
IMP × ECI (β_2)	6.771**	10.16***	5.686**	8.726**	5.673**	8.706**	8.448**
	(2.752)	(3.508)	(2.563)	(3.340)	(2.545)	(3.313)	(3.723)
ECI	16.22**	28.35***	13.64**	24.57***	15.96**	27.02***	21.56**
	(6.666)	(8.890)	(6.210)	(8.333)	(6.491)	(8.429)	(9.004)
Pol Stability		-7.711***		-7.649***		-7.665***	
		(1.713)		(1.690)		(1.690)	
FTAShare/μ			0.00271	0.0136	0.00282	0.0138	0.00191
			(0.00168)	(0.0109)	(0.00172)	(0.0109)	(0.00593)
Prod Diff Index (PDI)			1.452***	2.593***	3.564***	4.800***	4.328***
			(0.454)	(0.559)	(0.699)	(0.977)	(1.040)
PDI × ECI					-3.537***	-3.679**	-4.134***
					(0.879)	(1.420)	(1.198)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	51.25	18.02	63.15	16.31	62.39	16.30	26.30
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001

Table B.2: Full Sample – IV Tobit

	All Countries						LM Countries
IMP (β_1; ln(IFEE))	-5.104***	-12.72***	-4.498**	-11.72***	-4.407**	-11.66***	-6.142**
	(1.945)	(2.099)	(1.819)	(2.071)	(1.794)	(2.052)	(2.754)
IMP $\times$ ECI (β_2)	6.714**	11.47***	5.198*	9.355**	5.185*	9.340**	8.263**
	(3.144)	(3.947)	(2.935)	(3.798)	(2.915)	(3.769)	(4.186)
ECI	15.64**	30.87***	12.21*	25.60***	14.59**	28.21***	21.04**
	(7.594)	(10.02)	(7.074)	(9.439)	(7.332)	(9.505)	(9.932)
Pol Stability		-9.569***		-9.396***		-9.412***	
		(1.960)		(1.923)		(1.923)	
FTAShare/μ			0.00349	0.0156	0.00364	0.0158	0.0572
			(0.00302)	(0.0142)	(0.00308)	(0.0143)	(0.0381)
Prod Diff Index (PDI)			1.794***	3.249***	3.957***	5.578***	5.062***
			(0.528)	(0.637)	(0.826)	(1.160)	(1.264)
PDI $\times$ ECI					-3.615***	-3.875**	-4.563***
					(1.018)	(1.620)	(1.479)
Constant	1.881	-7.666	1.690	-6.615	0.285	-8.376	17.21***
	(4.166)	(5.464)	(3.928)	(5.385)	(3.990)	(5.568)	(6.648)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Wald Exogeniety p-value	0.0056	0.0000	0.0049	0.0000	0.0065	0.0000	0.0133

Table B.3: Strong Binding – IV Tobit

	All Countries						LM Countries	Binding > 0
IMP (β_1; ln(IFEE))	-0.869	3.221	-1.449	2.443	-1.460	2.478	-1.771	-1.056
	(1.312)	(2.740)	(1.285)	(2.545)	(1.278)	(2.553)	(1.547)	(1.357)
IMP $\times$ ECI (β_2)	-1.345	-3.990	-1.694	-3.181	-1.678	-3.233	-1.640	-1.104
	(2.748)	(3.702)	(2.841)	(3.347)	(2.820)	(3.358)	(3.755)	(2.728)
ECI	-3.227	-3.728	-3.764	-2.553	-3.250	-4.305	-2.258	-1.340
	(4.949)	(6.189)	(5.105)	(5.867)	(4.853)	(5.894)	(5.868)	(4.236)
Pol Stability		-9.454***		-9.455***		-9.433***		
		(1.688)		(1.680)		(1.670)		
FTAShare/μ			0.0267	0.162	0.0270	0.160	0.0144	0.0139
			(0.0278)	(0.181)	(0.0277)	(0.181)	(0.0132)	(0.0204)
Prod Diff Index (PDI)			2.108***	2.264***	2.472**	0.912	3.387**	1.969**
			(0.693)	(0.787)	(1.133)	(1.448)	(1.467)	(0.764)
PDI $\times$ ECI					-0.700	2.466	-3.114	-0.172
					(1.566)	(2.653)	(1.970)	(1.426)
Observations	31,620	31,620	25,022	25,022	25,022	25,022	16,522	13,250
Country FEs	Yes	No	Yes	No	Yes	No	Yes	Yes
Wald Exogeniety p-value	0.329	0.424	0.001	0.583	0.001	0.575	0.004	N/A: OLS

Table B.4: Weak Binding – IV OLS

	All Countries						LM Countries
IMP (β_1; ln(IFEE))	-7.421***	-9.663***	-6.568***	-9.132***	-6.376***	-8.982***	-9.645***
	(2.392)	(2.465)	(2.400)	(2.715)	(2.367)	(2.697)	(3.176)
IMP × ECI (β_2)	12.43***	12.46***	11.28***	11.54**	11.17***	11.42**	16.25***
	(4.263)	(3.985)	(4.242)	(4.465)	(4.216)	(4.444)	(5.498)
ECI	31.28***	36.97***	28.08***	33.99***	30.36***	35.74***	41.14***
	(10.64)	(10.52)	(10.56)	(11.55)	(10.84)	(11.64)	(13.37)
Pol Stability		-5.903***		-5.916***		-5.927***	
		(1.916)		(1.895)		(1.897)	
FTAShare/μ			0.00398	0.0148	0.00416*	0.0150	0.0573
			(0.00243)	(0.0113)	(0.00250)	(0.0114)	(0.0410)
Prod Diff Index (PDI)			1.306**	2.142***	3.619***	3.948***	4.353***
			(0.552)	(0.666)	(0.823)	(1.245)	(1.201)
PDI × ECI					-3.789***	-2.947*	-3.947***
					(0.987)	(1.649)	(1.283)
Observations	97,064	96,805	77,487	77,292	77,487	77,292	43,291
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	56.18	30.54	66.76	37.71	66.25	36.87	27.58
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001

B.2 IMP: Top 1/2 of IFEE

Tables B.5–B.8 replicated Tables 3–4 and 7–8 using, as measure of import market power, a dummy variable $IMP = 1$ iff $IFEE$ belongs to the top half of $IFEE$ in the sample.

Table B.5: Full Sample – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 1/2 IFEE)	-24.51***	-44.50***	-21.94***	-42.13***	-20.87***	-41.35***	-23.05**
	(7.398)	(9.398)	(7.680)	(10.33)	(7.322)	(10.07)	(9.251)
IMP $\times$ ECI (β_2)	35.31***	44.89**	25.71**	33.61*	24.67*	32.65*	35.32**
	(12.18)	(17.44)	(12.89)	(18.39)	(12.54)	(18.09)	(14.42)
ECI	-16.81***	-16.76**	-12.19**	-12.07	-9.282	-8.965	-14.89**
	(5.550)	(8.296)	(6.046)	(8.917)	(5.630)	(8.504)	(6.482)
Pol Stability		-7.768***		-7.560***		-7.582***	
		(1.737)		(1.710)		(1.708)	
FTAShare/μ			0.00141	0.0108	0.00161	0.0110	-0.000713
			(0.00176)	(0.0102)	(0.00180)	(0.0102)	(0.00624)
Prod Diff Index (PDI)			1.659***	2.739***	3.798***	5.058***	4.431***
			(0.474)	(0.534)	(0.730)	(0.978)	(1.076)
PDI $\times$ ECI					-3.596***	-3.869***	-4.305***
					(0.901)	(1.422)	(1.246)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	34.06	11.62	17.29	8.057	17.29	8.062	11.12
Underid p	0.0000	0.0001	0.0001	0.0005	0.0001	0.0005	0.0017

Table B.6: Full Sample – IV Tobit

	All Countries						LM Countries
IMP (β_1; Top 1/2 IFEE)	-27.30***	-54.33***	-22.95***	-49.95***	-21.75***	-49.10***	-24.92**
	(8.602)	(10.47)	(8.706)	(11.47)	(8.348)	(11.22)	(10.85)
IMP × ECI (β_2)	37.68***	50.90***	24.85*	36.08*	23.67*	35.04*	37.23**
	(13.46)	(19.19)	(14.12)	(20.32)	(13.74)	(20.02)	(15.95)
ECI	-18.43***	-20.17**	-12.07*	-13.67	-9.004	-10.36	-15.99**
	(6.148)	(9.186)	(6.653)	(9.940)	(6.248)	(9.520)	(7.383)
Pol Stability		-9.609***		-9.294***		-9.318***	
		(1.988)		(1.944)		(1.943)	
FTAShare/μ			0.00207	0.0121	0.00232	0.0124	0.0571
			(0.00295)	(0.0133)	(0.00300)	(0.0134)	(0.0397)
Prod Diff Index (PDI)			1.962***	3.397***	4.166***	5.856***	5.142***
			(0.548)	(0.608)	(0.843)	(1.120)	(1.265)
PDI × ECI					-3.699***	-4.095***	-4.766***
					(1.025)	(1.579)	(1.485)
Constant	26.87***	48.57***	22.96***	45.15***	20.70***	42.69***	43.45***
	(5.819)	(7.186)	(5.849)	(7.836)	(5.588)	(7.716)	(7.982)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Wald Exogeniety p-value	0.0009	0.0000	0.0124	0.0000	0.0149	0.0000	0.0148

Table B.7: Strong Binding Sample – IV Tobit

	All Countries					LM Countries	Binding > 0
IMP (β_1; Top 1/2 IFEE)	11.34	-2.405	11.94	-2.384	12.08	-9.469	-6.903
	(11.47)	(8.833)	(11.01)	(8.874)	(11.07)	(13.03)	(7.194)
IMP × ECI (β_2)	-11.81	-6.744	-12.95	-6.761	-13.20	-3.807	-6.180
	(18.34)	(15.52)	(18.06)	(15.60)	(18.07)	(20.17)	(13.11)
ECI	10.80	3.819	11.56	4.426	10.02	3.015	3.936
	(11.82)	(9.887)	(11.45)	(9.985)	(11.17)	(14.30)	(8.856)
Pol Stability	-9.504***		-9.643***		-9.617***		
	(1.695)		(1.702)		(1.689)		
FTAShare/μ		0.0281	0.168	0.0284	0.167	0.0116	0.0148
		(0.0323)	(0.184)	(0.0321)	(0.184)	(0.0140)	(0.0267)
Prod Diff Index (PDI)		1.869***	2.134***	2.330**	0.759	3.368**	1.788**
		(0.700)	(0.727)	(1.081)	(1.492)	(1.391)	(0.712)
PDI × ECI				-0.876	2.508	-3.277*	0.341
				(1.514)	(2.677)	(1.862)	(1.200)
Observations	31,620	25,022	25,022	25,022	25,022	16,522	13,250
Country FEs	No	Yes	No	Yes	No	Yes	Yes
Wald Exogeniety p-value	0.400	0.243	0.331	0.243	0.333	0.0254	N/A: OLS

Table B.8: Weak Binding Sample – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 1/2 IFEE)	-37.50***	-40.52***	-39.13**	-45.11***	-36.39**	-43.08**	-40.35**
	(10.96)	(11.54)	(14.93)	(16.93)	(14.17)	(16.49)	(15.18)
IMP × ECI (β_2)	65.07***	55.90**	57.54**	50.67	54.63**	48.23	75.77**
	(22.09)	(22.55)	(28.10)	(30.68)	(27.44)	(30.30)	(34.81)
ECI	-28.99***	-18.78*	-26.10**	-17.75	-22.13*	-14.41	-32.71**
	(9.797)	(9.697)	(12.69)	(13.62)	(12.03)	(13.27)	(15.93)
Pol Stability		-5.954***		-5.846***		-5.867***	
		(1.952)		(1.883)		(1.886)	
FTAShare/mu			0.00244	0.0120	0.00282	0.0124	0.0817
			(0.00304)	(0.0109)	(0.00307)	(0.0110)	(0.0500)
Prod Diff Index (PDI)			1.785***	2.511***	4.122***	4.444***	4.605***
			(0.523)	(0.596)	(0.867)	(1.202)	(1.180)
PDI × ECI					-3.881***	-3.179*	-4.431***
					(1.030)	(1.602)	(1.365)
Observations	97,064	96,805	77,487	77,292	77,487	77,292	43,291
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	23.51	19.31	9.307	9.686	9.309	9.650	5.867
Underid p	0.0000	0.0000	0.0005	0.0002	0.0005	0.0002	0.0068

B.3 IMP: Top 1/3 of IFEE

Tables B.9–B.12 replicated Tables 3–4 and 7–8 using, as measure of import market power, a dummy variable $IMP = 1$ iff $IFEE$ belongs to the top one-third of $IFEE$ in the sample.

Table B.9: Full Sample – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 1/3 IFEE)	-38.32**	-43.82**	-30.65*	-29.98*	-30.89**	-30.34*	-23.16*
	(15.68)	(17.88)	(15.52)	(15.67)	(15.51)	(15.63)	(12.66)
IMP $\times$ ECI (β_2)	39.94**	43.09	17.41	13.05	18.12	14.04	22.94
	(19.74)	(30.74)	(20.31)	(28.02)	(20.23)	(27.94)	(14.01)
ECI	-12.48**	-7.958	-5.256	1.175	-3.725	2.984	-4.819
	(6.272)	(10.20)	(6.637)	(9.112)	(6.782)	(9.192)	(5.565)
Pol Stability		-7.913***		-7.850***		-7.860***	
		(1.755)		(1.694)		(1.693)	
FTAShare/Mu			-0.00236	0.0107	-0.00230	0.0108	-0.00526
			(0.00262)	(0.0108)	(0.00263)	(0.0108)	(0.00721)
Prod Diff Index (PDI)			2.002***	2.421***	3.604***	4.317***	4.141***
			(0.515)	(0.504)	(0.747)	(1.017)	(1.054)
PDI $\times$ ECI					-2.670**	-3.160**	-3.453**
					(1.090)	(1.544)	(1.453)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	6.349	6.944	5.020	4.774	5.036	4.766	3.919
Underid p	0.0033	0.0014	0.0066	0.0061	0.0065	0.0061	0.0164

Table B.10: Full Sample – IV Tobit

	All Countries						LM Countries
IMP (β_1; Top 1/3 IFEE)	-45.79**	-54.98***	-36.47**	-38.61**	-36.51**	-38.89**	-27.94*
	(18.36)	(20.17)	(18.31)	(18.15)	(18.24)	(18.09)	(14.87)
IMP × ECI (β_2)	44.62**	47.27	18.63	12.47	19.05	13.36	25.24
	(22.28)	(34.14)	(23.21)	(31.76)	(23.04)	(31.59)	(15.68)
ECI	-14.52**	-9.783	-6.033	0.918	-4.430	2.778	-5.921
	(7.032)	(11.30)	(7.561)	(10.35)	(7.823)	(10.52)	(6.398)
Pol Stability		-9.695***		-9.522***		-9.532***	
		(2.028)		(1.951)		(1.951)	
FTAShare/μ			-0.00270	0.0112	-0.00259	0.0114	0.0475
			(0.00365)	(0.0140)	(0.00368)	(0.0141)	(0.0402)
Prod Diff Index (PDI)			2.413***	3.065***	3.984***	4.969***	4.840***
			(0.611)	(0.589)	(0.888)	(1.183)	(1.271)
PDI × ECI					-2.612**	-3.164*	-3.735**
					(1.312)	(1.749)	(1.780)
Constant	27.44***	37.50***	22.60***	31.36***	21.46***	29.92***	39.19***
	(6.837)	(8.127)	(6.819)	(7.756)	(7.038)	(8.009)	(6.608)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Wald Exogeniety p-value	0.0283	0.0006	0.0264	0.0012	0.0290	0.0014	0.245

Table B.11: Strong Binding Sample – IV Tobit

	All Countries						LM Countries	Binding > 0
IMP (β_1; Top 1/3 IFEE)	-14.69*	8.283	-23.75**	17.66	-23.81**	18.58	-19.83	-14.64
	(8.456)	(19.58)	(10.86)	(22.52)	(10.96)	(22.74)	(24.97)	(37.82)
IMP × ECI (β_2)	-0.0684	-19.91	0.510	-44.65	0.502	-46.57	-12.85	-9.927
	(0.894)	(34.04)	(1.161)	(39.47)	(1.156)	(40.06)	(38.59)	(48.43)
ECI	-1.161	10.30	-1.814	19.76	-2.296	18.58	3.246	3.197
	(1.023)	(14.44)	(1.290)	(16.14)	(2.015)	(16.10)	(18.49)	(23.23)
Pol Stability		-8.825***		-8.667***		-8.630***		
		(1.598)		(1.611)		(1.603)		
FTAShare/μ			0.00522	0.149	0.00554	0.147	-0.00912	-0.0169
			(0.0292)	(0.177)	(0.0291)	(0.177)	(0.0150)	(0.0488)
Prod Diff Index (PDI)			2.272***	2.707***	1.790	1.112	1.992	1.615
			(0.829)	(0.875)	(1.396)	(1.163)	(1.758)	(1.375)
PDI × ECI					0.831	2.922	0.0974	1.157
					(2.433)	(2.315)	(3.449)	(3.745)
Observations	31,620	31,620	25,022	25,022	25,022	25,022	16,522	13,250
Country FEs	Yes	No	Yes	No	Yes	No	Yes	Yes
Wald Exogeniety p-value	0.101	0.811	0.0094	0.295	0.0108	0.278	0.0129	N/A: OLS

Table B.12: Weak Binding Sample – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 1/3 IFEE)	-51.03**	-38.83	-31.12	-13.96	-30.71	-13.68	-12.55
	(21.71)	(27.93)	(20.13)	(23.59)	(20.02)	(23.61)	(17.84)
IMP $\times$ ECI (β_2)	73.25**	58.45	36.05	25.32	36.13	25.62	29.21
	(30.92)	(43.92)	(29.44)	(39.95)	(29.36)	(39.99)	(27.73)
ECI	-20.90**	-9.979	-10.09	-0.431	-7.879	1.586	-4.748
	(9.179)	(13.30)	(8.845)	(11.65)	(8.839)	(11.78)	(9.164)
Pol Stability		-6.033***		-6.213***		-6.222***	
		(1.996)		(1.960)		(1.963)	
FTAShare/μ			0.000848	0.0166	0.00103	0.0168	0.0641*
			(0.00305)	(0.0119)	(0.00308)	(0.0120)	(0.0345)
Prod Diff Index (PDI)			1.775***	1.773***	3.823***	3.659***	4.458***
			(0.562)	(0.655)	(0.776)	(1.136)	(1.045)
PDI $\times$ ECI					-3.340***	-3.072*	-4.305***
					(1.036)	(1.667)	(1.268)
Observations	97,064	96,805	77,487	77,292	77,487	77,292	43,291
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	4.100	5.043	3.230	3.814	3.212	3.790	2.226
Underid p	0.0123	0.0049	0.0205	0.0109	0.0208	0.0111	0.0513

B.4 IMP: Natural Log of World Import Share

Tables B.13–B.16 presents similar specifications as those in Tables 3–4 and 7–8 using $ln(WorldImportShare)$ as the measure of import market power. World import share is defined as the importing country's share of world trade in the concerned HS6 product. In all estimations an HS2-sector dummy is included. Import share is instrumented with the same two instruments from BBR: i) the average of a categorial variable – that takes the value of one if the import share is in the top two-thirds of all estimates – across the other products within an HS2 sector, and ii) the interaction of PDI and logged per capita GDP. The second instrument is why specifications similar to columns 3–7 in Tables 3–8 are not presented.

Table B.13: Full Sample – IV OLS

	All Countries		LM Countries		Original WTO Members	
IMP (β_1; Logged Import Share)	-3.822***	-5.870***	-4.374***	-2.733***	-5.040***	-5.836***
	(1.007)	(1.029)	(0.982)	(0.781)	(0.942)	(1.034)
IMP x ECI (β_2)	-0.588	1.170	-0.698	-1.067	0.742	1.729
	(0.962)	(1.287)	(0.899)	(1.212)	(0.894)	(1.271)
ECI	-16.07*	2.554	-12.65	-4.587	-5.448	6.417
	(8.540)	(8.163)	(7.941)	(7.065)	(7.697)	(8.036)
Pol Stability	-4.331*	-6.449***	-6.100***	-10.35***	-6.261***	-7.658***
	(2.232)	(1.773)	(2.125)	(1.387)	(1.993)	(1.708)
FTAShare/μ		0.0116*		0.0322		0.0120**
		(0.00660)		(0.0314)		(0.00598)
Observations	260,346	102,434	101,175	59,625	218,566	91,601
Weak Instrument F-Stat	151.7	46.05	96.66	52.52	155.6	53.15
Underid p	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Overid p	0.310	0.122	0.856	0.321	0.126	0.109

Table B.14: Full Sample – IV Tobit

	All Countries		LM Countries		Original WTO Members	
IMP (β_1; Logged Import Share)	-4.435***	-6.449***	-4.795***	-2.961***	-5.818***	-6.438***
	(1.099)	(1.114)	(1.096)	(0.927)	(1.028)	(1.156)
IMP x ECI (β_2)	-0.524	1.075	-0.884	-1.353	0.917	1.648
	(1.060)	(1.423)	(1.047)	(1.344)	(0.994)	(1.419)
ECI	-17.47*	1.006	-15.36*	-6.570	-6.208	4.951
	(9.441)	(9.159)	(9.299)	(7.953)	(8.687)	(9.130)
Pol Stability	-5.705**	-8.241***	-7.952***	-12.17***	-7.805***	-9.489***
	(2.383)	(1.925)	(2.368)	(1.673)	(2.143)	(1.913)
FTAShare/μ		0.0140		0.315		0.0141*
		(0.00913)		(0.226)		(0.00850)
Constant	26.81***	-4.343	12.75**	14.20**	20.48**	-2.909
	(8.375)	(7.008)	(6.437)	(6.416)	(7.961)	(7.080)
Observations	260,346	102,434	101,175	59,625	218,566	91,601
Wald Exogeniety p-value	0.0000	0.0000	0.0001	0.0102	0.0002	0.0000

Table B.15: Strong Binding – IV Tobit

	All Countries		LM Countries		Original WTO Members		Binding > 0
IMP (β_1; Logged Import Share)	0.242	-0.173	0.744	0.914	-0.396	-0.322	-31.70
	(0.604)	(0.711)	(1.075)	(1.246)	(0.761)	(0.887)	(1,013)
IMP x ECI (β_2)	-0.851	-1.581*	-1.071	-1.723	-0.828	-1.649*	52.92
	(0.529)	(0.821)	(1.134)	(1.270)	(0.715)	(0.914)	(1,727)
ECI	-5.913	-8.118*	-4.541	-5.840	-7.149	-9.012*	255.3
	(4.158)	(4.250)	(5.807)	(4.731)	(5.310)	(4.972)	(8,240)
Pol Stability	-7.061***	-8.328***	-17.08***	-15.88***	-8.135***	-9.150***	-0.121
	(1.457)	(1.576)	(4.098)	(3.490)	(2.050)	(2.460)	(115.8)
FTAShare/μ		0.118		0.151		0.147	0.232
		(0.156)		(0.169)		(0.182)	(8.600)
Observations	50,206	25,019	22,149	16,522	35,638	20,838	13,261
Wald Exogeniety p-value	0.345	0.0773	0.764	0.942	0.112	0.0629	N/A: OLS

Table B.16: Weak Binding IV OLS

	All Countries		LM Countries		Original WTO Members	
IMP (β_1; Logged Import Share)	-3.548***	-5.863***	-4.408***	-2.499**	-4.851***	-6.157***
	(1.347)	(1.239)	(1.137)	(1.020)	(1.296)	(1.238)
IMP $\times$ ECI (β_2)	-1.205	1.139	-0.373	-1.361	0.389	2.206
	(1.155)	(1.547)	(1.140)	(1.364)	(1.100)	(1.512)
Pol Stability	-4.192*	-5.544***	-3.584*	-8.033***	-4.941**	-5.868***
	(2.494)	(1.776)	(2.065)	(1.439)	(2.339)	(1.759)
ECI	-20.17**	3.816	-9.502	-5.532	-6.740	11.41
	(10.04)	(10.43)	(9.676)	(8.768)	(9.208)	(10.06)
FTAShare/μ		0.0121*		0.223		0.0128**
		(0.00647)		(0.223)		(0.00641)
Observations	208,911	77,280	78,674	43,095	181,702	70,628
Weak Instrument F-Stat	151	42.26	90.10	53.87	149.6	49.69
Underid p	0	0.0000	0.0000	0.0001	0	0.0000
Overid p	0.587	0.447	0.308	0.508	0.530	0.584

B.5 IMP: Natural Log of Total Imports

Tables B.17–B.20 presents similar specifications as those in Tables 3–4 and 7–8 using $ln(TotalImport)$ as the measure of import market power in the concerned HS6 product. In all estimations an HS2-sector dummy is included. Import share is instrumented with the same two instruments from BBR: i) the average of a categorial variable – that takes the value of one if total imports are in the top two-thirds of all estimates – across the other products within an HS2 sector, and ii) the interaction of PDI and logged per capita GDP. The second instrument is why specifications similar to columns 3–7 in Tables 3–8 are not presented.

Table B.17: Full Sample – IV OLS

	All Countries		LM Countries		Original WTO Members	
IMP (β_1; Logged Total Imports)	-4.117***	-6.368***	-4.803***	-2.978***	-5.076***	-6.426***
	(0.993)	(1.079)	(0.978)	(0.810)	(0.992)	(1.202)
IMP x ECI (β_2)	-1.421	-0.361	-1.148	-2.175*	-0.472	0.393
	(0.888)	(1.586)	(0.863)	(1.217)	(0.877)	(1.561)
ECI	-4.254	-7.064	-2.991	25.77	-14.81	-15.89
	(9.643)	(20.89)	(9.730)	(16.77)	(9.778)	(20.71)
Pol Stability	-4.626**	-6.712***	-5.887**	-10.16***	-6.399***	-7.562***
	(2.194)	(1.695)	(2.164)	(1.483)	(2.013)	(1.786)
FTAShare/μ		0.0104*		0.0222		0.0107**
		(0.00546)		(0.0312)		(0.00514)
Observations	260,346	102,434	101,175	59,625	218,566	91,601
Weak Instrument F-Stat	161.4	50.01	131.2	61.22	154.5	69.44
Underid p	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000
Overid p	0.319	0.144	0.728	0.567	0.0977	0.136

Table B.18: Full Sample – IV Tobit

	All Countries		LM Countries		Original WTO Members	
IMP (β_1; Logged Total Imports)	-4.756***	-7.004***	-5.297***	-3.255***	-5.863***	-7.113***
	(1.087)	(1.174)	(1.100)	(0.956)	(1.090)	(1.342)
IMP x ECI (β_2)	-1.421	-0.551	-1.316	-2.487*	-0.389	0.214
	(0.989)	(1.758)	(1.016)	(1.361)	(0.991)	(1.753)
ECI	-7.112	-6.268	-3.268	29.07	-18.91*	-15.33
	(10.73)	(23.04)	(11.33)	(18.61)	(10.97)	(23.10)
Pol Stability	-6.033**	-8.524***	-7.704***	-11.97***	-7.955***	-9.375***
	(2.345)	(1.862)	(2.413)	(1.773)	(2.165)	(2.003)
FTAShare/μ		0.0126*		0.309		0.0128*
		(0.00762)		(0.230)		(0.00731)
Constant	122.1***	133.1***	115.8***	78.17***	138.8***	135.1***
	(15.59)	(17.92)	(19.17)	(17.20)	(15.54)	(20.33)
Observations	260,346	102,434	101,175	59,625	218,566	91,601
Wald Exogeniety p-value	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000

Table B.19: Strong Binding Sample – IV Tobit

	All Countries		LM Countries		Original WTO Members		Binding > 0
IMP (β_1; Logged Total Imports)	0.207	-0.194	0.811	0.834	-0.314	-0.256	-1.373
	(0.667)	(0.859)	(1.239)	(1.407)	(0.865)	(1.139)	(2.613)
IMP × ECI (β_2)	-0.832	-1.808**	-0.850	-1.357	-0.909	-1.942*	0.971
	(0.573)	(0.884)	(1.074)	(1.133)	(0.789)	(1.022)	(4.657)
ECI	9.792	24.00*	13.95	21.61	9.128	25.30*	-11.77
	(7.697)	(13.22)	(16.19)	(18.37)	(10.58)	(15.27)	(64.92)
Pol Stability	-7.118***	-8.676***	-17.19***	-15.93***	-8.314***	-9.397***	-3.852***
	(1.414)	(1.554)	(4.103)	(3.553)	(2.030)	(2.456)	(1.153)
FTAShare/μ		0.123		0.149		0.152	-0.0215
		(0.160)		(0.170)		(0.188)	(0.0851)
Observations	50,206	25,019	22,149	16,522	35,638	20,838	13,261
Wald Exogeniety p-value	0.366	0.181	0.818	0.880	0.206	0.190	N/A: OLS

Table B.20: Weak Binding Sample – IV OLS

	All Countries		LM Countries		Original WTO Members	
IMP (β_1; Logged Total Imports)	-3.876***	-6.557***	-4.757***	-2.424**	-4.879***	-6.842***
	(1.366)	(1.386)	(1.091)	(1.129)	(1.352)	(1.466)
IMP × ECI (β_2)	-1.952*	-0.317	-0.926	-2.911**	-0.803	0.908
	(1.050)	(1.957)	(1.028)	(1.400)	(1.039)	(1.882)
ECI	2.394	-6.595	-4.568	36.43*	-9.854	-20.97
	(12.06)	(24.90)	(11.54)	(18.86)	(12.13)	(24.34)
Pol Stability	-4.387*	-5.602***	-3.406	-7.916***	-5.087**	-5.800***
	(2.493)	(1.775)	(2.080)	(1.501)	(2.374)	(1.834)
FTAShare/μ		0.0114**		0.185		0.0122**
		(0.00562)		(0.217)		(0.00575)
Observations	208,911	77,280	78,674	43,095	181,702	70,628
Weak Instrument F-Stat	170.7	42.98	99.75	71.98	153.2	54.71
Underid p	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Overid p	0.626	0.240	0.335	0.621	0.368	0.351

C Robustness to using unrounded tariff binding data

In the main text we used tariff bindings rounded to nearest multiple of 5 as the measure of negotiated tariffs. The following tables show the robustness of the results to using binding rates without rounding.

Table C.1: No Rounding—All Products – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-25.94***	-56.03***	-23.34***	-52.41***	-22.83***	-52.08***	-33.82**
	(9.040)	(9.177)	(8.352)	(8.927)	(8.232)	(8.822)	(13.83)
IMP $\times$ ECI (β_2)	36.19**	53.24***	30.44**	45.74**	30.36**	45.63***	46.49**
	(14.65)	(17.98)	(13.59)	(17.41)	(13.52)	(17.28)	(20.87)
ECI	-23.44**	-30.91***	-19.75**	-26.40**	-17.23**	-23.63**	-29.00**
	(9.508)	(11.60)	(8.819)	(11.42)	(8.403)	(11.04)	(13.69)
Pol Stability		-7.617***		-7.578***		-7.596***	
		(1.679)		(1.651)		(1.652)	
FTAShare/μ			0.00240	0.0128	0.00253	0.0130	0.00287
			(0.00185)	(0.0110)	(0.00190)	(0.0111)	(0.00767)
Prod Diff Index (PDI)			1.508***	2.813***	3.717***	5.194***	4.621***
			(0.467)	(0.567)	(0.712)	(0.942)	(1.070)
PDI $\times$ ECI					-3.712***	-3.973***	-4.454***
					(0.890)	(1.411)	(1.182)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	46.27	15.47	52.21	13.85	51.63	13.81	30.13
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table C.2: No Rounding—All Products – IV Tobit

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-26.02**	-60.38***	-24.40**	-55.90***	-23.86**	-55.57***	-34.13**
	(10.94)	(11.09)	(9.765)	(10.76)	(9.640)	(10.64)	(16.00)
IMP $\times$ ECI (β_2)	35.30**	54.33***	28.91*	44.94**	28.85*	44.89**	45.54*
	(16.73)	(20.88)	(15.44)	(20.27)	(15.34)	(20.12)	(23.30)
ECI	-23.19**	-31.94**	-18.99*	-26.14*	-16.39*	-23.20*	-28.30*
	(10.91)	(13.56)	(10.06)	(13.35)	(9.678)	(13.00)	(15.60)
Pol Stability		-9.232***		-9.073***		-9.093***	
		(1.907)		(1.863)		(1.863)	
FTAShare/μ			0.00332	0.0152	0.00348	0.0154	0.0598
			(0.00322)	(0.0143)	(0.00328)	(0.0144)	(0.0372)
Prod Diff Index (PDI)			1.757***	3.246***	4.042***	5.799***	5.199***
			(0.534)	(0.628)	(0.782)	(1.052)	(1.162)
PDI $\times$ ECI					-3.835***	-4.255***	-4.907***
					(0.961)	(1.522)	(1.303)
Constant	31.20***	63.80***	28.51***	59.28***	26.41***	56.96***	53.69***
	(8.925)	(9.668)	(8.132)	(9.663)	(7.870)	(9.512)	(12.96)
Observations	128,839	128,579	102,645	102,449	102,645	102,449	59,822
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Wald Exogeniety p-value	0.0255	0.0000	0.0089	0.0000	0.0114	0.0000	0.0296

Table C.3: No Rounding—Strong Binding – IV Tobit

	All Countries						LM Countries	Binding > 0
IMP (β_1; Top 2/3 IFEE)	-2.365	26.40*	-8.682	20.69	-8.723	20.87	-7.427	-6.406
	(7.369)	(14.88)	(6.557)	(14.52)	(6.546)	(14.56)	(9.686)	(7.204)
IMP $\times$ ECI (β_2)	-6.329	-25.34	-5.385	-19.16	-5.315	-19.44	-4.985	-6.580
	(13.35)	(20.34)	(13.53)	(19.16)	(13.49)	(19.24)	(17.84)	(16.23)
ECI	4.495	24.15	3.753	18.88	4.000	17.64	4.996	5.503
	(10.39)	(16.71)	(10.59)	(15.68)	(10.63)	(15.44)	(15.07)	(13.18)
Pol Stability		-9.213***		-9.202***		-9.182***		
		(1.787)		(1.766)		(1.758)		
FTAShare/μ			0.0218	0.146	0.0219	0.144	0.0107	0.0364
			(0.0214)	(0.167)	(0.0212)	(0.167)	(0.00921)	(0.0245)
Prod Diff Index (PDI)			1.973***	1.547*	2.185**	0.365	2.898**	2.071***
			(0.702)	(0.918)	(0.906)	(1.402)	(1.188)	(0.769)
PDI $\times$ ECI					-0.420	2.155	-2.862**	0.184
					(1.177)	(2.459)	(1.330)	(1.218)
Observations	31,620	31,620	25,022	25,022	25,022	25,022	16,522	13,250
Country FEs	Yes	No	Yes	No	Yes	No	Yes	Yes
Wald Exogeniety p-value	0.691	0.117	0.0167	0.286	0.0162	0.281	0.362	N/A: OLS

Table C.4: No Rounding—Weak Binding – IV OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-39.77***	-50.98***	-35.13***	-47.67***	-33.99***	-46.74***	-53.90***
	(12.63)	(12.62)	(12.37)	(13.90)	(12.14)	(13.75)	(18.49)
IMP $\times$ ECI (β_2)	66.12***	65.40***	60.04***	60.14**	59.45***	59.42**	88.12***
	(22.22)	(20.44)	(21.90)	(23.09)	(21.71)	(22.93)	(30.39)
ECI	-40.93***	-35.12***	-37.52***	-32.55**	-34.23**	-29.64**	-54.03***
	(14.00)	(12.73)	(13.79)	(14.52)	(13.24)	(14.22)	(19.59)
Pol Stability		-5.887***		-5.917***		-5.929***	
		(1.898)		(1.872)		(1.876)	
FTAShare/μ			0.00384	0.0144	0.00406	0.0147	0.0753
			(0.00286)	(0.0117)	(0.00293)	(0.0118)	(0.0584)
Prod Diff Index (PDI)			1.341**	2.251***	3.968***	4.420***	5.248***
			(0.568)	(0.646)	(0.871)	(1.190)	(1.323)
PDI $\times$ ECI					-4.319***	-3.545**	-5.231***
					(1.066)	(1.601)	(1.471)
Observations	97,064	96,805	77,487	77,292	77,487	77,292	43,291
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	44.33	25.32	47.76	46.35	47.37	46.90	15.72
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004

D Robustness to using 1994 trade data exclusively

To construct the ECI measure, we used trade data obtained from UN Comtrade at the six-digit level for 1994, with trade data from 1995, 1996, 2000, 2006, and 2007 supplementing missing importer-product observations from 1994. Moreover, for "new" WTO members (i.e., those who were not original members in 1995), we used trade data from 2000 instead of 1994 to better capture the trading patterns of these countries close to the time of their accession. To show the robustness of the results, here we report regression results in which the ECI measure is calculated using only 1994 trade data for all countries.

Table D.1: 1994 Trade Data—All Products – IV OLS

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-32.46***	-55.14***	-31.24***	-52.16***	-30.83***	-52.01***	-35.18**
	(11.90)	(9.404)	(10.99)	(9.395)	(10.89)	(9.355)	(14.04)
IMP x ECI (β_2)	46.43**	48.40**	42.24**	44.75**	42.26**	44.79**	49.20**
	(18.53)	(18.49)	(18.26)	(19.04)	(18.25)	(19.03)	(22.20)
ECI	-31.38**	-29.24**	-28.59**	-26.93**	-26.36**	-25.17**	-31.95**
	(12.29)	(12.45)	(12.11)	(12.73)	(11.70)	(12.51)	(14.71)
Pol Stability		-9.582***		-9.581***		-9.595***	
		(1.383)		(1.367)		(1.367)	
FTAShare/μ			0.00727	0.0581	0.00707	0.0584	0.00323
			(0.00847)	(0.0417)	(0.00874)	(0.0420)	(0.00739)
Prod Diff Index (PDI)			2.081***	3.411***	4.049***	4.962***	4.122***
			(0.567)	(0.529)	(0.820)	(0.989)	(0.973)
PDI x ECI					-3.370***	-2.639	-3.536***
					(0.983)	(1.576)	(1.094)
Observations	95,106	94,880	76,540	76,370	76,540	76,370	58,907
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	42.81	14.16	50.72	13.66	50.04	13.60	32.60
Underid p	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000

Table D.2: 1994 Trade Data—All Products – IV Tobit

	All Countries						LM Countries
IMP (β_1; Top 2/3 IFEE)	-35.48**	-66.59***	-33.41**	-60.48***	-32.94**	-60.29***	-37.47**
	(13.93)	(11.15)	(12.97)	(10.99)	(12.87)	(10.95)	(16.42)
IMP x ECI (β_2)	48.42**	55.85***	42.65**	50.30**	42.67**	50.38**	49.57**
	(21.15)	(21.19)	(20.90)	(21.77)	(20.88)	(21.75)	(25.09)
ECI	-33.28**	-35.09**	-29.24**	-31.08**	-26.91**	-29.00**	-32.46*
	(14.07)	(14.27)	(13.93)	(14.59)	(13.49)	(14.35)	(16.78)
Pol Stability		-11.24***		-11.21***		-11.22***	
		(1.650)		(1.632)		(1.632)	
FTAShare/μ			0.0778	0.491*	0.0792	0.494**	0.0566
			(0.0482)	(0.252)	(0.0484)	(0.251)	(0.0365)
Prod Diff Index (PDI)			2.492***	4.059***	4.543***	5.903***	4.805***
			(0.657)	(0.616)	(0.961)	(1.147)	(1.142)
PDI x ECI					-3.507***	-3.132*	-3.857***
					(1.122)	(1.732)	(1.294)
Constant	58.70***	70.57***	55.20***	64.36***	53.18***	62.70***	57.48***
	(11.51)	(10.62)	(10.91)	(10.73)	(10.53)	(10.66)	(13.36)
Observations	95,106	94,880	76,540	76,370	76,540	76,370	58,907
Country FEs	Yes	No	Yes	No	Yes	No	Yes
Wald Exogeniety p-value	0.0045	0.0000	0.0022	0.0000	0.0025	0.0000	0.0097

Table D.3: 1994 Trade Data—Strong Binding – IV Tobit

	All Countries						LM Countries	Binding > 0
IMP (β_1; Top 2/3 IFEE)	-3.821	31.09*	-13.43	21.24	-13.86	21.76	-18.23*	-10.22*
	(10.25)	(16.85)	(8.480)	(14.93)	(8.776)	(15.32)	(10.29)	(5.915)
IMP x ECI (β_2)	0.979	-35.30	7.336	-19.93	8.216	-20.87	13.53	7.162
	(9.988)	(25.19)	(9.586)	(18.67)	(10.01)	(19.67)	(10.55)	(10.26)
ECI	-1.699	31.94	-7.132	19.12	-6.749	18.50	-11.53	-6.386
	(8.436)	(21.78)	(8.205)	(16.88)	(8.085)	(16.12)	(8.863)	(8.351)
Pol Stability		-12.60***		-12.28***		-12.26***		
		(2.485)		(2.358)		(2.327)		
FTAShare/μ			0.00907	0.0560	0.00960	0.0540	0.0102	0.0239
			(0.0113)	(0.111)	(0.0116)	(0.109)	(0.0120)	(0.0213)
Prod Diff Index (PDI)			1.701**	1.488	2.644**	0.298	2.619**	1.052
			(0.742)	(1.114)	(1.104)	(1.964)	(1.046)	(0.766)
PDI x ECI					-1.773	2.182	-2.033	0.165
					(1.416)	(3.867)	(1.311)	(1.194)
Observations	23,641	23,641	18,786	18,786	18,786	18,786	16,374	8,359
Country FEs	Yes	No	Yes	No	Yes	No	Yes	Yes
Wald Exogeniety p-value	0.957	0.0871	0.240	0.312	0.238	0.306	0.179	N/A: OLS

Table D.4: 1994 Trade Data—Weak Binding – IV OLS

	All Countries						LM Countries
IMP (β_1)	-53.31***	-60.40***	-48.20***	-52.40***	-47.14***	-51.71***	-53.37***
	(14.69)	(14.14)	(14.38)	(15.47)	(14.16)	(15.41)	(18.43)
IMP × ECI (β_2)	83.47***	72.81***	76.24***	66.29**	75.59***	65.76**	87.30***
	(24.28)	(22.50)	(26.17)	(27.19)	(26.02)	(27.16)	(30.94)
ECI	-53.34***	-41.30***	-48.97***	-37.20**	-45.92***	-35.05**	-54.63**
	(15.73)	(14.54)	(16.88)	(17.38)	(16.36)	(17.37)	(20.02)
Pol Stability		-7.111***		-7.227***		-7.240***	
		(1.595)		(1.595)		(1.599)	
FTAShare/μ			0.116*	0.519*	0.115*	0.521*	0.0836
			(0.0689)	(0.285)	(0.0680)	(0.284)	(0.0617)
Prod Diff Index (PDI)			2.291***	2.930***	4.575***	4.472***	4.706***
			(0.677)	(0.663)	(1.019)	(1.296)	(1.277)
PDI × ECI					-3.836***	-2.580	-4.168***
					(1.185)	(1.771)	(1.415)
Observations	71,355	71,130	57,653	57,484	57,653	57,484	42,524
Country Dummy	Yes	No	Yes	No	Yes	No	Yes
Weak Instrument F-Stat	28.60	16.27	35.38	21.16	35.20	21.27	15.77
Underid p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004]

E Controlling for the effect of FTAs

The first 4 columns of Table E.1 show the result of regressions when alternative measures, namely, $FTAShare$, and $PTAShare/\mu$, are used to control for within-FTA trade flows. Under all of these alternative measures, the coefficient of IMP is negative and statistically significant, as predicted by the theory. The size of these coefficients are reduced when a more liberal definition of FTAs is used.

The last four columns replicate the regression on weak bindings, which was presented in Table 4, using a different definition of weak binding in which a tariff line of a country is labeled as "weak" if overhang was observed *before* the implementation of new FTAs in that country. As we explained in Subsection 6.3, this robustness check is conducted to capture the potential effect of FTA tariff complementarity on the set of weakly bound tariff lines. This more-restrictive definition of weak binding does affect our results.

Table E.1: Trade Agreement Robustness – IV OLS

	Full Sample				1996 Weak Binding Sample			
IMP (β_1; Top 2/3 IFEE)	-23.76***	-48.88***	-6.121*	-33.21***	-49.64**	-49.17**	-49.21**	-48.03**
	(8.439)	(8.605)	(3.264)	(7.427)	(22.64)	(22.78)	(22.07)	(22.40)
IMP x ECI (β_2)	33.59**	46.77**	1.665	9.574	92.36**	78.15*	89.35**	73.63*
	(14.81)	(18.00)	(2.024)	(7.637)	(40.94)	(40.85)	(39.53)	(38.96)
ECI	-19.22**	-22.49**	0.616	-2.101	-59.40**	-47.22*	-57.33**	-42.45
	(9.109)	(11.25)	(1.209)	(4.514)	(26.70)	(27.09)	(25.59)	(25.72)
Pol Stability		-7.554***		-7.492***		-6.002***		-6.228***
		(1.641)		(1.659)		(1.916)		(1.895)
FTAShare/μ					0.0756	0.492*		
					(0.0682)	(0.276)		
FTAShare	-1.125	-10.54***					-1.237	-8.894*
	(0.690)	(3.819)					(1.397)	(4.740)
PTAShare/μ			0.00252**	0.00973				
			(0.00102)	(0.00677)				
Prod Diff Index (PDI)	3.822***	5.565***	2.797***	3.938***	2.392***	2.371	2.475***	3.089**
	(0.735)	(0.955)	(0.628)	(1.081)	(0.834)	(1.567)	(0.821)	(1.438)
PDI x ECI	-3.761***	-4.774***	-2.241***	-1.722	-3.108***	0.271	-3.138***	-0.665
	(0.904)	(1.377)	(0.799)	(1.503)	(1.112)	(2.252)	(1.094)	(1.811)
Observations	104,704	104,505	100,999	100,803	34,921	34,786	35,234	35,098
Country Dummy	Yes	No	Yes	No	Yes	No	Yes	No
Weak Instrument F-Stat	46.32	16.57	49.64	14.49	11.37	11.96	12.20	12.66
Underid p	0.0000	0.0000	0.0000	0.0001	0.0039	0.0033	0.0036	0.0028

[1] SEs clustered at Country level

[2] *** p<0.01, ** p<0.05, * p<0.1

[3] HS2 dummies included in all estimations.

[4] IMP is instrumented with ROW Import Demand Elasticity.