The Free-Riding Effect of the MFN Clause: Evidence Across Countries

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November 2006

Abstract

This paper conducts a cross-country analysis of the free rider problem associated with the Most-Favored-Nation (MFN) clause in the WTO. We develop a model that relates MFN free riding to the degree of concentration of the exporters and market power of the importers of any product. Specifically, the model predicts that the level of the importer's tariff resulting from negotiations should be negatively related to the product of exporter concentration, as measured by a Herfindahl-Hirschman index (sum of squared export shares), and the importer's market power, as measured by the importer's share of world imports, on a product-by-product basis. We test this hypothesis using data on tariffs, trade and production in 81 sectors across 35 countries WTO countries and find strong support.

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We thank Luigi Guiso, Giovanni Maggi and other seminar participants at Ente Einaudi Research Seminar.

> Besides, it would certainly be inconsistent with the most obvious principles of justice and fair construction, that because France purchases, at a great price, a privilege of the United States, that therefore the Dutch shall immediately insist, not on having the like privileges for the like price, but without any price at all.[1]
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> *John Jay, 1787*

1. Introduction

In his report to Congress concerning the US-Netherlands Treaty of 1782, US Secretary of Foreign Affairs John Jay (later the first Chief Justice of the US Supreme Court) voiced opposition to the inclusion of the unconditional Most-Favored-Nation (MFN) clause in international trade agreements. He argued that because MFN commits a country (the US, in his case) to treat all of its trade agreement partners equally, the trade concessions it exchanges with any one partner (France) must automatically be extended to the others (the Netherlands), who thereby get a free ride. While Jay was apparently concerned about the fairness of this rule, subsequent authors raised the possibility that it might lead to a *free rider problem*, wherein countries "deliberately refrain from making concessions … in order [to] avoid the obligation of extending such concessions to other countries" (Viner, 1924, p. 105). Questions about the validity and economic significance of this problem have occupied academics and policymakers ever since. Today, the MFN clause is one of the pillars of the GATT/WTO system – any trade policy measure that a WTO country applies to the products of another WTO country must be applied equally to the same products of all WTO countries.[2] As the WTO grows in both membership and scope, the question of whether or not MFN creates a free rider problem is as important as ever.

The previous literature has been divided about the importance of the MFN free rider problem. While formal models of the problem exist (e.g., Caplin and Krishna, 1988), recent theoretical literature casts doubt on its relevance to the GATT/WTO system (e.g., Ludema, 1991, Bagwell and Staiger, 2002). On the empirical side, early work by Finger (1979) and Lavergne (1983) find evidence suggestive of an MFN free rider problem in US tariffs. This is confirmed by

[1] Quoted in Viner (1924), p. 104.
[2] Except in special cases were preferences are allowed, such as free trade areas or customs unions permitted under GATT Article 24.

Ludema and Mayda (2006), which provides the first theory-based empirical assessment, finding strong evidence of a significant free-rider effect of the MFN clause for US tariffs. On the other hand, Bagwell and Staiger (2006) finds no evidence of MFN free riding in the tariffs of countries recently acceding to the WTO.

This paper seeks to estimate the MFN free-rider effect across a multitude of WTO countries. There are several reasons for doing this. The most obvious is to see whether the MFN free rider problem is general or specific to the US. Moreover, only by finding the free-rider effect in all major trading countries can we begin to add up the global impact of MFN. Yet perhaps the most interesting reason to conduct a cross-country, cross-commodity analysis is that it allows us to get at one of the key drivers of the MFN free rider problem: monopoly power in trade. Only when a country is large enough to affect world prices can it actually affect free riders, when it exchanges concessions with another country. In other words, without monopoly power in trade, free riders can get no free ride. We should expect, therefore, the MFN free rider problem to be more pronounced for countries that are large and for products where large countries are especially dominant. This is what we find.

Our analysis follows on the work of Ludema and Mayda (2006). That paper develops a theoretical model that identifies the MFN-free-rider component of a country's tariff schedule based solely on observable data from the market for each product. The model predicts that only the largest exporters of each product will participate in negotiations with an importer for the reduction of the importer's tariff. This prediction accords with both anecdotal evidence on free riding found in earlier work and with a WTO negotiating convention, known as the "principal supplier rule." The model also predicts that the level of the importer's tariff resulting from negotiations should be negatively related to exporter concentration, as measured by a Herfindahl-Hirschman index (sum of squared export shares) on a product-by-product basis. Using U.S. MFN tariff rates for both 1983 (following the Tokyo Round) and 1989-1999 (during and after the Uruguay Round), the paper found strong evidence of this negative relationship, controlling for a host of political and economic factors. Finally, the model predicts that the severity of the MFN free rider effect should be greater for markets in which the country has greater monopoly power in trade. This is prediction is central to the present analysis.

To conduct the empirical analysis, we construct a global data set on tariffs, trade and production. The World Bank Trade and Production database (Nicita and Olarreaga 2001) contains the necessary data for a small sample of mostly low and middle-income countries. We expand and update this database adding data for several high and middle-income countries. Following Broda, Limao and Weinstein (2005), we use the importing country's share of world imports in each sector as a measure of market power.

In addition to making a clear contribution to the literature on MFN per se, this paper makes a contribution to the broader literature on the economics of international trade institutions. In this literature, pioneered by Bagwell and Staiger (2002), one of the key questions is whether or not terms-of-trade effects drive international trade agreements. Recent empirical work by Broda, Limao and Weinstein, (2005) and Bagwell and Staiger (2006) provides evidence that terms-of-trade effects do indeed matter for trade policy. However, these studies have been restricted to non-WTO countries and accession countries, respectively. Our theoretical and empirical work provides a way to capture the terms-of-trade effect for WTO countries, which account for the vast majority of trade. Our results strongly confirm the terms-of-trade hypothesis.

Section 2 presents the model developed in Ludema and Mayda (2006). Section 3 describes the cross-country data sets used. Section 4 discusses the empirical strategy and main results of the analysis. Finally, Section 5 concludes.

2. Theory

Consider a simple partial equilibrium model with one importing country that imports a good from several exporting countries. Suppose a subset of the exporters are members of a free-trade agreement with the importer, and thus face no impediments to trade, while the rest are subject to the importer's MFN tariff. All countries are assumed to be members of the WTO. Let τ denote one plus the ad valorem tariff rate imposed by the importer. Let Φ denote the share of total imports of the good by the importing country that are exported by FTA members. Let the non-

FTA exporters be indexed by $i = 1, 2, \ldots, N$, and let θ_i denote the exports of country i as a share of total non-FTA exports. For simplicity, assume all θ_i are constant.

The objective of the government of an exporting country is to maximize welfare.[3] The government of the importing country seeks to maximize a weighted sum of welfare, domestic producer surplus and the welfare of its FTA partners. Welfare is given a weight of one, while producer surplus receives an extra weight of λ, which is interpreted as political pressure from organized import-competing producers. The weight on the welfare of FTA partners is denoted ϕ. This reflects the extent to which FTA partners exert influence over the importer to preserve their preferential market access.

Suppose the government of the importing country sits down with the governments of a set $A \subseteq N$ of non-FTA exporters to negotiate a trade deal. Assume that the outcome of the negotiations is a tariff that is Pareto efficient for the participants. Assume also that countries have access to transfers by which to allocate the gains from this tariff choice among the participants, but non-participants make no transfers. In this setting, Pareto efficiency for participants is equivalent to maximizing the sum of the payoffs of the importer and the members of *A*. The resulting tariff is,

$$\tau^e(A) = \frac{1 + \frac{1}{\xi}\left(1 - \Theta_A\right)}{1 - \frac{\lambda}{\tilde{\mu}}\frac{X}{M} + \frac{(1-\phi)}{\tilde{\mu}}\Phi} \qquad (1)$$

where *M* denotes total imports, *X* denotes domestic production in the importing country, $\tilde{\mu}$ and ξ are the elasticities of demand for, and supply of, exports from non-FTA countries,

[3] Our theoretical model can easily accommodate exporting governments that maximize a weighted welfare function (placing extra weight on producer surplus, for example). However, in this short sketch of our model, we focus only on the components for which we currently have data.

respectively,[4] and $\Theta_A \equiv \Sigma_{i \in A} \theta_i$ is the cumulative market share of participants (as a share of non-FTA exports).

Equation (1) reflects three different channels affecting the negotiated tariff. The numerator captures the MFN free rider effect: the larger the market share of non-participants $1 - \Theta_A$ the higher is the tariff. When participants negotiate a tariff reduction, non-participants gain improved market access to the importing country without paying for it – they are free riders. The negotiated tariff level reflects the fact that only a fraction Θ_A of a tariff reduction's total benefit to non-FTA exporters is internalized by participants. Moreover, the total benefit to non-FTA exporters depends on how much the tariff affects their terms of trade, as measured by $1/\xi$. Thus, the MFN free rider effect is proportional to the terms-of-trade effect of the tariff. In the extreme case of no participants ($\Theta_\varnothing = 0$), the numerator of (1) is just the standard optimal tariff formula. If all countries participate ($\Theta_N = 1$), then the terms-of-trade effect is fully internalized by participants and the numerator becomes unity. This would imply free trade but for some terms in the denominator.

The two terms in the denominator of (1) reflect the power of domestic producers and FTA partners, respectively. The domestic political pressure term is familiar from the work of Grossman and Helpman (1994, 1995). In their work, $\lambda = (I_L - \alpha_L)/(a + \alpha_L)$, where I_L is an indicator of whether or not the sector is organized into a lobby, α_L is the fraction of the electorate represented by a lobby, and *a* measures the government's concern for welfare relative to lobby contributions. Empirical work by Goldberg and Maggi (1999) and Gawande and Bandyopodhayay (2000) has confirmed that the sign of the effect of the inverse import penetration X/M on NTBs depends on political organization. According to our model, we expect the same to be true of tariffs. The FTA term takes into account that tariff reductions by the importing country erode the preferential access enjoyed by FTA partners. If the importing country does not fully internalize this negative externality on its FTA partners ($\phi < 1$), it will cut tariffs more the larger is the FTA share of total trade. Alternatively, if maintaining the

[4] The elasticity of demand for non-FTA exports can be decomposed as $\tilde{\mu} \equiv \mu + \xi_F \Phi$, where μ is the importing country's elasticity of total import demand, and ξ_F is the elasticity of export supply from FTA members.

preference margin is a high priority, it could be that $\phi > 1$, in which case the tariff would increase with FTA share.[5]

The goal of the empirical analysis is to properly measure the numerator of equation (1), the MFN free rider term, and estimate its effect on MFN tariffs, controlling for domestic political pressure and FTA effects as represented by the denominator of equation (1). The main obstacle is that we do not directly observe the set of participants involved in negotiating any given tariff, therefore we cannot construct the variable Θ_A. For this reason, we need a theory of participation. Developing such a theory allows us to investigate the root cause of the MFN free rider problem in addition to its effects on tariffs.

Participation is assumed to be voluntary. Assume a two-stage game: in the first stage, all countries decide to participate or not in the negotiations; in the second stage, participants negotiate a tariff according to equation (1). Suppose A is an equilibrium set of participating exporters. Each member $i \in A$ knows that by refusing to participate it will increase the resulting negotiated tariff from $\tau^e(A)$ to $\tau^e(A \setminus i)$. On the other hand, if the importer refuses to participate the tariff increases from $\tau^e(A)$ to $\bar{\tau} \equiv \tau^e(\varnothing)$. Thus, the total surplus available to allocate between the importer and members of A is,

$$\Omega(A) \equiv \sum_{i \in A} w_i(\tau^e(A)) - w_i(\tau^e(A \setminus i)) - [w_0(\bar{\tau}) - w_0(\tau^e(A))] \qquad (2)$$

where w_i and w_0 denote the payoffs (gross of transfers) of exporter i and the importer, respectively. It follows that there exists an allocation of the surplus between the importer and members of A that supports A as an equilibrium set of participants, if and only if, $\Omega(A) \geq 0$.

For purposes of illustration, consider the following approximation of (2):

[5] Limão (2002) provides a model in which the importer uses the preference margin as a means to induce its FTA partner to provide a regional public good. His model effectively delivers $\phi > 1$. Empirical work by Limão (2006) finds tariffs increase with preferential trade share in the US, whereas Estevadeordal, et. al. (2006) find the opposite for Latin America.

$$\Omega(A) \approx \sum_{i \in A} \theta_i^2 \omega(A) - [w_0(\bar{\tau}) - w_0(\tau^e(A))] \tag{3}$$

where $\omega(A) \equiv -(\Sigma_{i \in N} w_i')^2 / [w_0'' + \Sigma_{i \in A} w_i''] > 0$. This approximation is accurate if the export shares are small. Note that the available surplus depends on the sum of the squared export shares of the participants. This is because the impact of an exporting country's participation decision on the negotiated tariff is proportional to its export share (from equation (1)). Moreover, the amount an exporting country gains with a tariff change is also proportional to its export share. Thus, a participant's contribution to the surplus (which is the difference between what it gets by participating and not participating) depends on the product of the two effects, both proportional to the export share. Summing these over all participants gives the sum of squared export shares.

The condition $\Omega(A) \geq 0$ narrows the set of possible equilibria considerably; however, it does not generally produce a unique outcome. What is needed is a rule, or bargaining protocol, to determine how the surplus is divided among any given set of participants. Suppose the WTO (the collection of all countries, participants and free riders alike) has as its objective to maximize the total payoff of its members, while respecting the right of each member to voluntarily participate (or not) in negotiations and allowing those who do participate to negotiate the tariff that is Pareto efficient for them. This calls for a rule that selects from the sets satisfying $\Omega(A) \geq 0$ those with the minimum $\tau^e(A)$.

Three conclusions follow from this assumption. Proofs can be found in Ludema and Mayda (2006). First, full participation occurs if and only if the Herfindahl-Hirschman index of non-FTA export shares, $H \equiv \Sigma_{i \in N} \theta_i^2$, is sufficiently high. This can be seen immediately from (4) evaluated at $A = N$, $\Omega(N) \approx H\omega(N) - [w_0(\bar{\tau}) - w_0(\tau^e(N))]$. If H is too low, $\Omega(N)$ will be negative and thus full participation cannot be sustained. Second, in the search for optimal sets of participants, we can restrict attention to sets satisfying the Principal Supplier Rule (PSR), with minimal loss of generality. The PSR simply says that the set of participants should include all

exporters above a certain size, as measured by export share. Third, under PSR and less-than-full participation, if the distribution of export shares is geometric, then any increase in H increases the cumulative market share of the optimal set of participants and thereby decreases the equilibrium tariff.[6]

3. Cross-country data

To carry out the cross-country empirical analysis, we need information on a number of variables for a multitude of importing countries. We construct a dataset of trade, production and tariff data for 35 countries comprising a wide range of income levels. The data set includes information on applied MFN tariff rates,[7] multilateral and bilateral trade flows and production for 81 manufacturing industries at the 4-digit level of the International Standard Industrial Classification (ISIC Rev. 2). The data set covers the period from 1989 to 1999. This period of time includes the final years of the Uruguay round – which took place in 1986-1994 – and its implementation period.

All bilateral and multilateral import and export data are from the World Bank's Trade and Production Database (WBTPD) (Nicita and Olarreaga 2001). The WBTPD is also the source of data on domestic production and applied MFN tariff rates for 21 mostly middle and low-income countries.[8] We have augmented this initial dataset with data for 14 additional countries by collecting production and tariff data from the UNIDO INDSTAT4 (2006) Industrial Statistics Database and UNCTAD's TRAINS, respectively.[9] Drawing data from these additional sources is

[6] Actually, this conclusion holds for any class of distributions that can be ranked according to first-order stochastic dominance.

[7] We use *applied* MFN tariff rates as opposed to *bound* rates. In practice, the difference between the two tariff rates in the US data is quite small. While our theoretical model makes no distinction between the two, Bagwell and Staiger (2005) provide a theory that accounts for the difference, based on private information about political pressure. In their model, the bound rate is chosen to ensure the incentive compatibility of applied rates, whereas applied rates maximize the expected welfare of the negotiating parties. Accordingly, the applied rate is the more appropriate measure of our efficient tariff.

[8] The 21 countries covered by the World Bank data set are (date of entry into GATT/WTO is in parenthesis): Bolivia (1990), Canada (1948), Chile (1949), Cameroon (1963), Colombia (1981), Costa Rica (1990), Ecuador (1996), Egypt (1970), Guatemala (1991), Hong Kong (1986), Honduras (1994), Indonesia (1950), India (1948), Korea (1967), Mexico (1986), Malaysia (1957), Philippines (1979), Singapore (1973), Turkey (1951), U.S. (1948), Venezuela (1990).

[9] Production and tariff data from these sources is used for 14 countries (date of entry into GATT/WTO is in parenthesis): Australia (1948), Bangladesh (1972), European Union (varies by country), Japan (1955), Malawi

particularly important because it allows us to expand the analysis to include a greater number of high-income, high-trade countries. Finally, we have obtained information on GATT/WTO membership from Rose (2004). Summary statistics of the main variables used in the empirical analysis are presented in the Appendix.

There are two main advantages of our dataset. First, the period of time it covers allows us to pay attention to the timing of the negotiation and implementation of tariff agreements. This is important in the empirical analysis given that one might expect tariffs observed during the implementation period to be affected more by the HHI prevailing during the negotiation period than by the contemporaneous HHI. A second advantage is that it provides data *across countries*, according to the same international classification. The two disadvantages are, first, the unavailability of data on sectors' political organization status and import-demand elasticities and, second, the level of disaggregation, which is not very high. We use industry dummy variables to address the first problem.

4. Cross-country analysis of the free-riding effect of the MFN clause

Ludema and Mayda (2006) tests the theoretical model in Section 2 focusing on a single importing country, the United States, and ignoring cross-product variation in the monopoly power term $1/\xi_k$. Thus, in our previous work, we estimate an *average* free rider effect across all sectors *k* for a country, the U.S., with presumably significant monopoly power in most goods. However, there is no reason to believe that the predictions of the theoretical model only apply to the US case. As a matter of fact, the free-riding effect of the MFN clause should be at work for any country that can affect world prices with its trade policy. It is through changes in world prices (terms-of-trade effect) that non-participating exporting countries benefit thanks to the importing country's tariff reduction and that the free-riding effect of the MFN clause occurs. The main task of this paper is to go beyond the U.S. case and estimate the MFN free-rider problem for a multitude of countries. In doing this, however, we encounter countries that may have very little market power in most goods. Thus it becomes imperative to account for market power both

(1964), Morocco (1987), New Zealand (1948), Norway (1948), Pakistan (1948), Panama (1997), Peru (1951), Romania (1971), South Africa (1948) and Thailand (1982).

across goods and across countries. This has the added benefit of giving us more precise estimates of the MFN free-rider problem (even for the U.S.) and clearly linking the problem to the terms-of-trade effect.

To apply the theoretical model to the data, we assume that the tariff on each product[10] k is the outcome of an independent negotiation.[11] While it is fairly standard to assume separable utility functions, so as to obtain independence across optimal tariffs, our assumption also requires that countries make their participation decisions on a good-by-good basis. Note that equation (1) equals 1 (free trade) if there is full participation, no domestic political pressure and negligible FTA share. Taking a first-order Taylor approximation of (1) around this point, and adding an error term, we obtain the following estimating equation: [12]

$$\tau_k - 1 = \frac{1}{\xi_k}\left(1 - \Theta_{A_k}\right) + \frac{\lambda_k}{\mu_k}\frac{X_k}{M_k} - \frac{1-\phi}{\mu_k}\Phi_k + \varepsilon_k \,. \tag{4}$$

The theory suggests that the export share of free riders $1 - \Theta_{A_k}$ should be negatively affected by the Herfindahl-Hirschman index (HHI) which we measure as,

$$H_k = \frac{\sum_{i \in GATT} M_{ik}^2}{\left(\sum_{i \in MFN} M_{ik}\right)^2}, \tag{5}$$

where *MFN* is the set of all non-FTA countries that export product k to and are granted MFN treatment by the importing country, while *GATT* is the subset of *MFN* consisting of members of the GATT/WTO (and are therefore potential participants in the multilateral negotiations). M_{ik} is the value of the importing country's imports of good k from country i. Thus the HHI so defined

[10] We use the terms products, sectors and goods interchangeably: they all refer to 4-digit codes. Industries are defined at a higher level of aggregation (3-digit codes) than sectors.

[11] Given the cross-country dimension of the empirical model, we also assume that interactions between the different import markets are of second-order importance.

[12] Note that the import demand elasticity μ_k appears in equation (4) instead of the FTA-augmented elasticity found in (1). This is because our approximation occurs around the point of zero FTA share, where the two elasticities are the same.

equals the sum of squared shares of exports to the importing country over *all* potential (non-FTA) participants in multilateral negotiations.

Our empirical results confirm the importance of cross-sector and cross-country variation in monopoly power. The impact of sector concentration in regression (1), Table 1, is negative but not significant. In regression (2), Table 1, we still estimate an average effect of sector concentration on, but we also control for the other determinants of the MFN tariff rate suggested by the theoretical model (we also add importing country fixed effects, as in all regressions of Table 1). Due to lack of data on λ_k and μ_k, we control for domestic political pressure and the import demand elasticity *indirectly* by using industry dummy variables which, following the model, we interact with the inverse import penetration ratio. We also control for the FTA market share. Regression (2) thus looks as follows:

$$\tau_{95-99,k} - 1 = \alpha + \beta \cdot H_{93,k} + \sum_l \eta_l \cdot I_l \frac{X_{93,k}}{M_{93,k}} + \nu \cdot \Phi_{FTA\,93,k} + \varepsilon_k , \qquad (7)$$

where $\tau_{95-99,k} - 1$ is the average *ad-valorem* importing country's MFN tariff rate over the years 1995-1999, $X_{93,k}/M_{93,k}$ is the inverse import-penetration ratio in 1993 (ratio of domestic total output to imports), $\Phi_{FTA\,93,k}$ is FTA countries' share of the importing country's imports in 1993, k is the 4-digit ISIC code and l is the 3-digit ISIC code. The dummy variables corresponding to the 3-digit ISIC codes (I_l) capture the impact of each industry's political organization and import demand elasticity, which are assumed to be constant over time. We find that the average effect of the HHI is again negative and insignificant. Note also that *FTA share* has a negative and significant (at the 10% level) coefficient, suggesting that importing countries do not fully internalize the effect of their tariffs on their FTA partners (i.e., $\phi < 1$).

However, our sample includes several small countries that are likely to have little monopoly power in most sectors, and only a few large open economies. As the average country in the sample is small, we might expect no free-riding effect on average. Therefore, in our next specification we investigate the cross-sector heterogeneity in the free-riding effect. We

differentiate the impact of the HHI according to the importing country's power to affect world prices in a given sector, which is higher the lower is the export supply elasticity. To operationalize this idea we follow Broda, Limão and Weinstein (2006) who find that "the higher a country's share in world imports in a particular good, the smaller the export supply elasticity it faces" (p.4). We thus use the importing country's share of world imports in each sector to proxy for its market power. In practice, we introduce the HHI variable both in linear form and in interaction form with the country's share of world imports of each good:

$$\tau_{95-99,ck} - 1 = \alpha + \beta \cdot H_{93,ck} + \rho \cdot H_{93,ck} \cdot MP_{93,ck} + \sum_{l} \eta_l \cdot I_l \frac{X_{93,ck}}{M_{93,ck}} + \nu \cdot \Phi_{FTA93,ck} + \sum_{c} \gamma_c I_c + \varepsilon_k \quad (8)$$

We expect the coefficient β to be zero and ρ to be negative. Intuitively, the free-rider effect on tariffs should be more pronounced for sectors where the importing country has a larger import market. This is what we find in regression (3), Table 1, where the coefficient on the interaction variable is negative and significant at the 1% level, while the direct effect of sector concentration is insignificant. Our results do not change when we also control for the direct impact of *market share* in regression (4), Table 3. Our preferred specification is column (5), where we drop the direct (insignificant) effect of the HHI. Based on the coefficient estimates in this specification and considering a situation in which the importing country captures one quarter of a given good's market, a 10 percentage points increase in the Herfindahl-Hirschman index reduces that importing country's MFN tariff rate by 0.9 percentage points (this change is not small given that the mean of the dependent variable in that regression is 13 percentage points).

We test the robustness of our findings in regressions (6)-(10). First, in column (6), we drop observations for Singapore and Hong Kong, which have both high markets shares, on average, and zero tariffs. We next add, as controls, the share of each importing country's total exports to the top five exporters of each good and the non-GATT market share. In considering the impact of these two controls, we account for cross-product variation in monopoly power by interacting them them with the variable *market share*. The reason for the first control is reciprocity.[13] The

[13] Bown (2004) uses essentially the same measure. He finds that the greater a country's export dependence on the principal suppliers of a given product, as measured by the share of its worldwide exports (of all products) sold to

logic behind the latter control is that we include non-GATT countries receiving MFN treatment (e.g., China, for several importing countries) in the denominator of the HHI but exclude them from the numerator, because they are not potential participants. Therefore, the higher the non-GATT market share the lower our measure of the HHI. Therefore, by controlling for the non-GATT market share, we can check whether the negative impact of the HHI is mostly driven by countries who cannot participate in negotiations (because they are not GATT-WTO members) as opposed to being driven by countries who decide not to (Although they are members of the GATT-WTO system). We find evidence consistent with both effects taking place.

4. Conclusions

Together with the U.S. results (Ludema and Mayda 2005), our cross-country empirical results provide evidence that tariffs are indeed driven by a terms-of-trade effect. By looking at WTO countries, our empirical work complements the recent literature on the same topic, which has focused on non-WTO and accession countries, respectively (Broda, Limao and Weinstein 2005, Bagwell and Staiger 2006).

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those suppliers, the less likely it is to implement protection (safeguards and safeguard-like measures) on that product.

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Table 1: Free-riding and MFN tariff rates *across countries*

OLS with importing country (IC) fixed effects	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Dependent variable	**Average MFN tariff rate (1995-1999)**									
Herfindhal index (1993)	-0.8	-0.44	0.8	0.55						
	0.92	1.16	1.28	1.31						
Herfindhal index (1993)*market share (1993)			**-50.44**	**-40.51**	**-36.26**	**-32.79**	**-36.01**	**-36.07**	**-28.05**	**-26.44**
			14.14**	**15.39****	**13.18****	**13.86***	**13.31****	**13.29****	**16.32+**	**16.21+**
market share (1993)				-6.71	-7.38	-13.79	-7.18	-6.22	-12.4	-5.84
				3.99+	3.82+	6.03*	4.10+	4.14	7.06+	7.35
share of IC's exports to top 5 exporters (1993)*market share (1993)							-19.6	-134.76		
							86.94	98.79		
share of IC's exports to top 5 exporters (1993)								10.4		
								5.55+		
non-GATT market share (1993)*market share (1993)									12.12	-15.92
									10.91	13.23
non-GATT market share (1993)										4.66
										1.39**
FTA share (1993)		-2.43	-2.27	-2.37	-2.37	-2.46	-2.37	-2.37	-2.31	-1.91
		1.29+	1.27+	1.28+	1.28+	1.28+	1.28+	1.28+	1.28+	1.29
Constant	9.97	10.04	9.71	9.78	9.93	9.94	9.93	9.84	9.93	9.56
	0.27**	0.32**	0.34**	0.36**	0.12**	0.12**	0.12**	0.13**	0.12**	0.18**
inverse import penetration ratio (1993)*ISIC3 DV	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2747	1715	1715	1715	1715	1575	1715	1715	1715	1715
R-squared	0.58	0.59	0.59	0.59	0.59	0.53	0.59	0.59	0.59	0.59

Source: World Bank's Trade & Production Database. Robust standard errors under each estimated coefficient. + significant at 10%; * significant at 5%; ** significant at 1%. Outliers (MFN tariff rates higher than 50) are excluded. MFN tariff rates (in percentage points) are simple averages at the 4 digit level ISIC. For each sector, the Herfindhal index equals the sum of squared import shares from each exporting country to a given importing country. The Herfindhal index is calculated excluding countries which are part of a preferential trade agreement with the importing country and excluding countries without MFN treatment. Countries which do not belong to the WTO but receive MFN treatment by the importing country are included in the denominator of the Herfindhal index, but not in the numerator. The inverse import penetration ratio equals the ratio of output value to imports in each sector. The FTA Share gives the overall import share (by sector) from countries which are part of a preferential trade agreement with the importing country. See definitions of other variables at the end of the Appendix. Importing country fixed effects are included in each regression. Regression (6) excludes Hong Kong and Singapore f EC countries are considered as one block (taking into account when each country joined the EC – date in parentheses): Belgium (1958), Luxembourg (1958), Netherlands (1958), Germany (1958), France (1958), Italy (1958), Denmark (1973), Ireland (1973), United Kingdom (1973), Cyprus (1973), Greece (1981), Portugal (1986), Spain (1986) were part of the EC in 1989; (Andorra joined it in 1991;) Austria, Finland, and Sweden joined it in 1995; Turkey joined the customs union in 1996.

Appendix: Summary Statistics of variables

Importing Country (IC)	Variable	N	mean	sd	min	max
AUS	**MFN tariff rate (1995-1999)**	81	4.48	4.29	0.00	26.67
	Herfindahl index (1993)	81	0.21	0.13	0.02	0.70
	Market share (1993)	81	0.01	0.01	0.00	0.05
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	81	0.00	0.01	0.00	0.06
	non-GATT market share (1993)	81	0.13	0.15	0.00	0.65
BGD	**MFN tariff rate (1995-1999)**	81	24.61	10.41	0.00	37.50
	Herfindahl index (1993)	81	0.31	0.21	0.00	1.00
	Market share (1993)	81	0.00	0.01	0.00	0.05
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	81	0.00	0.02	0.00	0.21
	non-GATT market share (1993)	80	0.14	0.18	0.00	0.81
BOL	**MFN tariff rate (1995-1999)**	81	9.74	0.68	6.58	10.00
	Herfindahl index (1993)	81	0.28	0.13	0.00	0.72
	Market share (1993)	81	0.00	0.00	0.00	0.00
	FTA Share (1993)	80	0.06	0.08	0.00	0.34
	Inverse Import Penetration Ratio (1993)	68	44.94	235.42	0.00	1789.85
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.05	0.00	0.37
	non-GATT market share (1993)	80	0.07	0.11	0.00	0.70
CAN	**MFN tariff rate (1995-1999)**	79	7.26	5.22	0.00	28.20
	Herfindahl index (1993)	79	0.29	0.19	0.02	0.77
	Market share (1993)	79	0.04	0.02	0.00	0.11
	FTA Share (1993)	79	0.61	0.23	0.04	0.98
	Inverse Import Penetration Ratio (1993)	66	5.37	8.68	0.18	50.07
	share of IC's exports to top 5 exporters (1993)	79	0.01	0.02	0.00	0.11
	non-GATT market share (1993)	79	0.16	0.18	0.00	0.75
CHL	**MFN tariff rate (1995-1999)**	81	10.67	0.40	7.53	10.75
	Herfindahl index (1993)	81	0.24	0.15	0.01	1.00
	Market share (1993)	81	0.00	0.00	0.00	0.04
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	81	24.40	81.00	0.00	632.18
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.03	0.00	0.26
	non-GATT market share (1993)	81	0.09	0.14	0.00	0.81
CMR	**MFN tariff rate (1995-1999)**	81	20.71	7.46	5.19	30.00
	Herfindahl index (1993)	81	0.00	0.00	0.00	0.00
	Market share (1993)	81	0.00	0.00	0.00	0.00
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	0	.	.	.	.
	non-GATT market share (1993)	0	.	.	.	.

Appendix: Summary Statistics of variables (cont.)

Importing Country (IC)	Variable	N	mean	sd	min	max
COL	**MFN tariff rate (1995-1999)**	81	13.81	4.30	5.52	20.00
	Herfindahl index (1993)	81	0.34	0.17	0.07	0.95
	Market share (1993)	81	0.00	0.00	0.00	0.01
	FTA Share (1993)	81	0.17	0.23	0.00	0.99
	Inverse Import Penetration Ratio (1993)	73	52.74	253.59	0.02	2095.75
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.12
	non-GATT market share (1993)	81	0.06	0.09	0.00	0.46
CRI	**MFN tariff rate (1995-1999)**	81	10.26	6.52	0.50	37.16
	Herfindahl index (1993)	81	0.33	0.20	0.02	1.00
	Market share (1993)	81	0.00	0.00	0.00	0.01
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	65	75.28	460.23	0.00	3655.28
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.17
	non-GATT market share (1993)	81	0.12	0.16	0.00	0.83
ECU	**MFN tariff rate (1995-1999)**	81	14.13	4.62	2.82	20.50
	Herfindahl index (1993)	81	0.36	0.19	0.00	0.97
	Market share (1993)	81	0.00	0.00	0.00	0.00
	FTA Share (1993)	81	0.14	0.18	0.00	0.98
	Inverse Import Penetration Ratio (1993)	81	44.45	159.10	0.00	1250.92
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.05	0.00	0.38
	non-GATT market share (1993)	81	0.13	0.20	0.00	0.91
EGY	**MFN tariff rate (1995-1999)**	68	24.51	11.81	5.00	49.23
	Herfindahl index (1993)	68	0.34	0.18	0.01	0.97
	Market share (1993)	68	0.00	0.00	0.00	0.03
	FTA Share (1993)	68	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	68	47.61	234.02	0.00	1811.95
	share of IC's exports to top 5 exporters (1993)	68	0.01	0.02	0.00	0.17
	non-GATT market share (1993)	68	0.13	0.15	0.00	0.91
EU	**MFN tariff rate (1995-1999)**	80	5.85	4.99	0.00	36.54
	Herfindahl index (1993)	80	0.16	0.12	0.01	0.61
	Market share (1993)	80	0.15	0.06	0.05	0.30
	FTA Share (1993)	80	0.13	0.12	0.00	0.65
	Inverse Import Penetration Ratio (1993)	80	9.37	14.13	0.06	70.06
	share of IC's exports to top 5 exporters (1993)	80	0.00	0.01	0.00	0.05
	non-GATT market share (1993)	80	0.17	0.15	0.01	0.81
GTM	**MFN tariff rate (1995-1999)**	81	10.65	6.45	0.50	25.31
	Herfindahl index (1993)	81	0.33	0.18	0.09	0.85
	Market share (1993)	81	0.00	0.00	0.00	0.00
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	81	68.68	502.38	0.00	4478.44
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.11
	non-GATT market share (1993)	81	0.09	0.11	0.00	0.70

Appendix: Summary Statistics of variables (cont.)

Importing Country (IC)	Variable	N	mean	sd	min	max
HKG	**MFN tariff rate (1995-1999)**	81	0.00	0.00	0.00	0.00
	Herfindahl index (1993)	81	0.10	0.09	0.01	0.64
	Market share (1993)	81	0.09	0.08	0.00	0.39
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	68	0.35	0.74	0.00	3.95
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.01	0.00	0.09
	non-GATT market share (1993)	81	0.41	0.14	0.02	0.76
HND	**MFN tariff rate (1995-1999)**	81	10.56	6.04	1.00	21.76
	Herfindahl index (1993)	81	0.38	0.15	0.02	0.81
	Market share (1993)	81	0.00	0.00	0.00	0.01
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	80	1.35	5.16	0.00	43.44
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.01	0.00	0.08
	non-GATT market share (1993)	81	0.10	0.14	0.00	0.80
IDN	**MFN tariff rate (1995-1999)**	78	15.10	9.47	0.23	48.69
	Herfindahl index (1993)	78	0.22	0.14	0.02	0.74
	Market share (1993)	78	0.01	0.01	0.00	0.04
	FTA Share (1993)	78	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	76	31.02	126.35	0.00	1078.21
	share of IC's exports to top 5 exporters (1993)	78	0.01	0.02	0.00	0.14
	non-GATT market share (1993)	78	0.14	0.14	0.00	0.75
IND	**MFN tariff rate (1995-1999)**	77	32.70	6.94	10.42	40.37
	Herfindahl index (1993)	77	0.31	0.21	0.00	0.94
	Market share (1993)	77	0.00	0.01	0.00	0.08
	FTA Share (1993)	77	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	75	595.67	3218.66	0.26	26971.63
	share of IC's exports to top 5 exporters (1993)	77	0.01	0.02	0.00	0.16
	non-GATT market share (1993)	76	0.11	0.14	0.00	0.72
JPN	**MFN tariff rate (1995-1999)**	81	4.56	6.11	0.00	24.52
	Herfindahl index (1993)	81	0.22	0.17	0.00	0.77
	Market share (1993)	81	0.06	0.05	0.01	0.34
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	81	39.90	80.58	0.45	634.72
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.15
	non-GATT market share (1993)	81	0.20	0.20	0.00	0.97
KOR	**MFN tariff rate (1995-1999)**	79	10.26	8.34	2.45	45.93
	Herfindahl index (1993)	79	0.27	0.14	0.02	0.79
	Market share (1993)	79	0.02	0.02	0.00	0.20
	FTA Share (1993)	79	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	79	19.16	32.27	0.02	195.75
	share of IC's exports to top 5 exporters (1993)	79	0.01	0.02	0.00	0.13
	non-GATT market share (1993)	79	0.14	0.17	0.00	0.84

Appendix: Summary Statistics of variables (cont.)

Importing Country (IC)	Variable	N	mean	sd	min	max
MAR	**MFN tariff rate (1995-1999)**	78	22.95	10.69	3.54	38.90
	Herfindahl index (1993)	78	0.58	0.25	0.01	1.00
	Market share (1993)	78	0.00	0.00	0.00	0.02
	FTA Share (1993)	78	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	78	0.01	0.03	0.00	0.20
	non-GATT market share (1993)	78	0.09	0.13	0.00	0.73
MEX	**MFN tariff rate (1995-1999)**	80	16.06	6.54	3.92	45.50
	Herfindahl index (1993)	80	0.60	0.17	0.21	0.98
	Market share (1993)	80	0.02	0.01	0.00	0.11
	FTA Share (1993)	80	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	55	5.17	13.29	0.15	82.98
	share of IC's exports to top 5 exporters (1993)	80	0.01	0.03	0.00	0.19
	non-GATT market share (1993)	80	0.02	0.04	0.00	0.23
MWI	**MFN tariff rate (1995-1999)**	81	26.23	10.02	1.85	45.00
	Herfindahl index (1993)	81	0.00	0.00	0.00	0.00
	Market share (1993)	81	0.00	0.00	0.00	0.00
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	0	.	.	.	.
	non-GATT market share (1993)	0	.	.	.	.
MYS	**MFN tariff rate (1995-1999)**	77	10.21	8.59	0.00	32.02
	Herfindahl index (1993)	77	0.22	0.18	0.03	0.97
	Market share (1993)	77	0.01	0.01	0.00	0.04
	FTA Share (1993)	77	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	69	4.18	7.03	0.00	47.34
	share of IC's exports to top 5 exporters (1993)	77	0.01	0.04	0.00	0.31
	non-GATT market share (1993)	77	0.14	0.14	0.00	0.76
NOR	**MFN tariff rate (1995-1999)**	81	4.08	4.82	0.00	23.39
	Herfindahl index (1993)	81	0.03	0.06	0.00	0.50
	Market share (1993)	81	0.01	0.01	0.00	0.12
	FTA Share (1993)	81	0.77	0.19	0.21	1.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	81	0.00	0.01	0.00	0.06
	non-GATT market share (1993)	81	0.05	0.08	0.00	0.42
NZL	**MFN tariff rate (1995-1999)**	81	5.06	3.71	0.00	22.11
	Herfindahl index (1993)	81	0.26	0.16	0.04	0.71
	Market share (1993)	81	0.00	0.00	0.00	0.01
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	3	56.72	37.04	24.33	97.11
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.15
	non-GATT market share (1993)	81	0.09	0.12	0.00	0.60

Appendix: Summary Statistics of variables (cont.)

Importing Country (IC)	Variable	N	mean	sd	min	max
PAK	**MFN tariff rate (1995-1999)**	41	37.74	9.99	8.19	49.85
	Herfindahl index (1993)	41	0.32	0.26	0.01	1.00
	Market share (1993)	41	0.00	0.01	0.00	0.03
	FTA Share (1993)	41	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	41	0.00	0.01	0.00	0.02
	non-GATT market share (1993)	41	0.17	0.18	0.00	0.91
PAN	**MFN tariff rate (1995-1999)**	81	13.38	5.86	1.61	28.09
	Herfindahl index (1993)	81	0.38	0.17	0.08	0.89
	Market share (1993)	81	0.00	0.00	0.00	0.00
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.16
	non-GATT market share (1993)	81	0.03	0.06	0.00	0.27
PER	**MFN tariff rate (1995-1999)**	81	13.66	2.17	12.00	21.25
	Herfindahl index (1993)	81	0.23	0.18	0.00	1.00
	Market share (1993)	81	0.00	0.00	0.00	0.03
	FTA Share (1993)	81	0.13	0.17	0.00	0.91
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.03	0.00	0.22
	non-GATT market share (1993)	81	0.10	0.16	0.00	0.89
PHL	**MFN tariff rate (1995-1999)**	81	16.11	6.97	3.63	31.00
	Herfindahl index (1993)	81	0.24	0.17	0.01	0.88
	Market share (1993)	81	0.00	0.00	0.00	0.02
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	73	13.80	38.85	0.00	274.33
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.18
	non-GATT market share (1993)	81	0.13	0.15	0.00	0.84
ROM	**MFN tariff rate (1995-1999)**	76	17.62	7.55	0.00	39.11
	Herfindahl index (1993)	76	0.04	0.10	0.00	0.73
	Market share (1993)	76	0.00	0.00	0.00	0.01
	FTA Share (1993)	76	0.60	0.23	0.03	0.97
	Inverse Import Penetration Ratio (1993)	22	18.80	24.93	0.49	77.07
	share of IC's exports to top 5 exporters (1993)	76	0.00	0.00	0.00	0.03
	non-GATT market share (1993)	76	0.14	0.16	0.00	0.96
SGP	**MFN tariff rate (1995-1999)**	81	0.00	0.00	0.00	0.00
	Herfindahl index (1993)	81	0.24	0.17	0.04	0.92
	Market share (1993)	81	0.02	0.02	0.00	0.09
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	72	2.01	10.49	0.00	89.22
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.02	0.00	0.14
	non-GATT market share (1993)	81	0.11	0.10	0.00	0.59

Appendix: Summary Statistics of variables (cont.)

Importing Country (IC)	Variable	N	mean	sd	min	max
THA	**MFN tariff rate (1995-1999)**	75	23.62	12.28	2.45	49.29
	Herfindahl index (1993)	75	0.25	0.16	0.00	0.91
	Market share (1993)	75	0.01	0.01	0.00	0.04
	FTA Share (1993)	75	0.00	0.01	0.00	0.10
	Inverse Import Penetration Ratio (1993)	70	47.02	221.50	0.01	1696.98
	share of IC's exports to top 5 exporters (1993)	75	0.01	0.02	0.00	0.11
	non-GATT market share (1993)	75	0.14	0.15	0.00	0.93
TUR	**MFN tariff rate (1995-1999)**	78	9.96	8.79	0.63	48.41
	Herfindahl index (1993)	78	0.51	0.23	0.07	1.00
	Market share (1993)	78	0.01	0.01	0.00	0.03
	FTA Share (1993)	78	0.07	0.12	0.00	0.85
	Inverse Import Penetration Ratio (1993)	77	387.72	3074.68	0.10	26992.78
	share of IC's exports to top 5 exporters (1993)	78	0.01	0.02	0.00	0.19
	non-GATT market share (1993)	78	0.11	0.13	0.00	0.49
USA	**MFN tariff rate (1995-1999)**	80	4.18	2.98	0.00	14.85
	Herfindahl index (1993)	80	0.23	0.16	0.02	0.79
	Market share (1993)	80	0.16	0.07	0.03	0.33
	FTA Share (1993)	80	0.20	0.18	0.01	0.80
	Inverse Import Penetration Ratio (1993)	77	16.06	22.99	0.30	103.92
	share of IC's exports to top 5 exporters (1993)	80	0.01	0.01	0.00	0.06
	non-GATT market share (1993)	80	0.16	0.17	0.01	0.71
VEN	**MFN tariff rate (1995-1999)**	81	14.11	4.28	5.93	20.00
	Herfindahl index (1993)	81	0.37	0.17	0.07	0.81
	Market share (1993)	81	0.00	0.00	0.00	0.01
	FTA Share (1993)	81	0.11	0.15	0.00	0.86
	Inverse Import Penetration Ratio (1993)	75	83.08	578.35	0.00	5002.90
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.06	0.00	0.52
	non-GATT market share (1993)	81	0.06	0.09	0.00	0.41
ZAF	**MFN tariff rate (1995-1999)**	81	10.51	9.19	0.00	41.59
	Herfindahl index (1993)	81	0.32	0.17	0.03	0.85
	Market share (1993)	81	0.00	0.00	0.00	0.02
	FTA Share (1993)	81	0.00	0.00	0.00	0.00
	Inverse Import Penetration Ratio (1993)	0	.	.	.	.
	share of IC's exports to top 5 exporters (1993)	81	0.01	0.03	0.00	0.21
	non-GATT market share (1993)	81	0.10	0.14	0.00	0.75
Total	**MFN tariff rate (1995-1999)**	2890	13.49	10.82	0.00	49.85
	Herfindahl index (1993)	2890	0.27	0.22	0.00	1.00
	Market share (1993)	2890	0.02	0.04	0.00	0.39
	FTA Share (1993)	2889	0.08	0.21	0.00	1.00
	Inverse Import Penetration Ratio (1993)	1751	71.28	955.32	0.00	26992.78
	share of IC's exports to top 5 exporters (1993)	2728	0.01	0.03	0.00	0.58
	non-GATT market share (1993)	2706	0.12	0.16	0.00	0.97

Outliers (MFN tariff rates higher than 50) are excluded. MFN tariff rates (in percentage points) are simple averages at the 4 digit level ISIC. For each sector, the Herfindhal index equals the sum of squared import shares from each exporting country to a given importing country. The Herfindhal index is calculated excluding countries which are part of a preferential trade agreement with the importing country and excluding countries without MFN treatment. Countries which do not belong to the WTO but receive MFN treatment by the importing country are included in the denominator of the Herfindhal index, but not in the numerator. The inverse import penetration ratio equals the ratio of output value to imports in each sector. The FTA Share gives the overall import share (by sector) from countries which are part of a preferential trade agreement with the importing country.

The *share of IC's exports to top 5 exporters (1993)* gives the fraction of total exports of each importing country going to the five principal suppliers of each product. The *non-GATT market share (1993)* is exports to each importing country by countries which are granted MFN treatment by that importing country but are not GATT/WTO members, as a fraction of total imports of that importing country from non-FTA countries which receive MFN treatment.