Liberalization Agreements in the GATT/WTO and the Terms-of-trade Externality Theory: Evidence from Three Developing Countries

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RESEARCH ARTICLE

Liberalization Agreements in the GATT/WTO and the Terms-of-trade Externality Theory: Evidence from Three Developing Countries.

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The terms-of-trade theory suggests that governments engage in trade negotiations with their trade partners in an effort to escape from a terms-of-trade prisoner's dilemma by mutually internalizing externalities that they impose on each other. In this paper, I use predictions of the terms-of-trade relationship to provide support for the theory based on the negotiating patterns of three developing countries during the Uruguay Round of the Generalized Agreements on Tariff and Trade. I use industry level import value as well tariff schedules from these contracting party states that were graduated from the U.S. Generalized System of Preferences list during the Uruguay Round. I exploit the rapid change in their tariff schedules from the best response to the optimal level within a single negotiation round to empirically test the terms-of-trade theory. I find that my estimates are consistent with the predictions of the theory as applied to these three developing countries that were compelled to negotiate for tariff concessions during the Uruguay Round. (JEL F11, F13)

Keywords: Developing Countries, Multilateral Agreements, Tariffs, Terms-of-trade

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1. Introduction

In this paper, I test the predictions of the terms-of-trade theory using developing countries that participated in multilateral trade negotiations during the Uruguay Round of the Generalized Agreements on Tariff and Trade (GATT). I use bound and unbound tariff schedule information corresponding to import value data from three developing countries. I exploit the change in their tariff schedule during a single round as they were compelled to engage in multilateral negotiations after being removed from the United States' Generalized System of Preferences (GSP) list during the Uruguay Round. I find that their tariff concession patterns is in line with

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the predictions of the terms-of-trade theory. Accordingly, this paper contributes to what is still a very lacking empirical literature addressing a long standing question about what trade negotiators negotiate about.

It is apparent that the participant nations' main objective in creating the GATT and, subsequently, the WTO system is to have an international forum to liberalize trade. However, what they actually negotiate about in how to share the pie of the gains from more liberal trade is not immediately obvious. According to the terms-of-trade prisoner's dilemma theory, countries negotiate to remove barriers to trade as a way to internalize externalities that they impose on each other. In other words, nations use international trade institutions as a forum to negotiate concessions that will enable them to escape from a terms-of-trade prisoner's dilemma. As such, they are able to reciprocally reduce inefficiencies that are a consequence of barriers to trade as well as reap the benefits of engaging in more trade. While this theoretical framework that provides a basis for multilateral trade negotiations is well developed, the empirical literature in support of this hypothesis significantly lags behind. Furthermore, none extends far back to the GATT years to study the relevance of this theory as it applies to earlier rounds of negotiations.

In this paper, I use disaggregated data from three developing countries (i.e. Brunei, Paraguay, and South Korea) that participated in the Uruguay Round trade negotiations under GATT in order to test the terms-of-trade theory. Prior to the Uruguay Round, these countries were granted preferential treatment as GSP beneficiaries and were not required to accord reciprocal tariff reduction concessions to other GATT contracting members. Thus, they were in a position to set their tariff schedule according to the social planner's utility maximization solely as a function of payoff to domestic constitutents. This is referred to as the best response tariff. During the Uruguay Round, however, these countries were graduated from the U.S.'s GSP list and were compelled to engage in multilateral negotiations to reciporcally reduce their tariff barriers. Their tariff schedule subsequent to these negotiations, also referred to as the politically optimal tariff, are set as the optimal level of concessions taking both domestic constitutents' and trading partners' interest into account.

The fact that these countries went from their best response tariff level to the politcally optimal within a short period of time during a single negotiation round provides a natural experiment environment to test the terms-of-trade theory. Using disaggregated data on both import value and the difference in tariff schedules before and after the Uruguay Round, I am able to test if the tariff concesssion patterns for these three countries are consistent with the predictions of the terms-of-trade theory. More specifically, I take to the data the prediction that the bound tariff level will be set lower relative to the unbound level as the pre-negotiation import value for a given product is higher. I find that my estimates are consistent with these predictions of the terms-of-trade relationship and are statistically significant at various levels of industry fixed-effect disaggregations. Furthermore, when I introduce a country-industry fixed-effect, the results persist and are statistically significant on the full sample. Results at the individual country level are also in line with the terms-of-trade theory predictions, while the results at the individual industry level are mixed and inconclusive.

Consistent with the terms-of-trade theory, my findings suggest that some developing countries do in fact have trade matters to negotiate about in the international trade negotiation forum and mutually benefit from an agreement. Furthermore, in light of the fact that all parties have something to negotiate about, this finding may give additional weight to the pressing question about why the Doha Round remains stagnant.

The remainder of this paper is organized as follows. In Section 2, first, I explain the terms-of-trade theory, as articulated in the literature. Secondly, I present the model, à la Bagwell and Staiger (2011), with which they formulate a testable hypothesis. In Section 3, I explain how I use the model to test the theory that countries negotiate to escape from a terms-of-trade prisoner's dilemma. In Section 4, I provide a detailed description of the data, the empirical challenges they raise, and how I resolve them. In Section 5, I report my results. Finally, I conclude in Section 6.

2.   Terms-of-trade Theory

2.1   *Terms-of-trade Theory: Literature Review*

One theoretical explanation for the existential purpose of international trade institutions is for them to serve as a forum to mitigate the terms-of-trade prisoner's dilemma that trading nations are faced with. [1] The origin of this theory dates back to Johnson (1954) in which the author notes that in the absence of trade agreements, the import tariffs imposed and the trade wars that will ensue would lead countries to an inefficient trade protection equilibrium. Nations that are large enough to affect world prices of a good they import can impose tariffs on such imports to improve their terms-of-trade. In turn, their large country trading partners will impose retaliatory tariffs leading to a wash of any terms-of-trade gain. In effect, these countries are left with larger trade barriers that have significant distortionary impact. Yet, none are able to benefit from a net terms-of-trade gain. Thus, the theory suggests, these countries resolved to pull themselves out from such a lose-lose equilibrium by using international trade institutions as a forum to negotiate and enter into mutually beneficial trade liberalization agreements. While Mayer (1981) illustrated this point in a simple static game-theoretic framework, Grossman and Helpman (1995a) as well as Bagwell and Staiger (1999), which was further developed in Bagwell and Staiger (2002), have argued that the result persists even in a more complicated environment where a government is faced with domestic political pressure.

However, while Bagwell and Staiger (2011) make a great leap forward in providing evidence for the terms-of-trade theory, little empirical study has been done trying to substantiate the terms-of-trade theory or shed more light in general on what member states negotiate about.[2] Accordingly, in this paper, I focus on conducting an empirical exercise using import and tariff data from three developing countries to test the validity of the terms-of-trade prisoner's dilemma theory. To do so, I exploit the fact that these countries are GATT contracting parties and were engaged in making substantial tariff concessions during the Uruguay Round.

In order to do so, first it is instructive to note that the terms-of-trade theory suggests that each country on the negotiating table has an economic influence in

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[1]Other theories include the (1) commitment theory, Maggi and Rodriguez-Clare (2007), which argues that governments enter into binding international trade because they value making strong level of liberalization commitments to their domestic private stakeholders (2) the relocation theory, Ossa (2011), which argues that trade negotiations could enable countries to internalize a "production relocation externality". The latter literature builds upon Krugman (1980) and Venables (1987) which help identify the production relocation effect of tariff as well as Baldwin and Robert-Nicoud (2000) which applies this mechanism to a trade agreement environment. Finally, Antras and Bagwell (2012), explain that cost-shifting mechanisms through offshoring introduce an additional layer of complexity in international trade agreemetns.

[2]In their paper 'What Do Trade Negotiators Negotiate About? Empirical Evidence from the World Trade Organization', AER 2011, Bagwell and Staiger use data from 16 countries to test and validate the terms-of-trade theory by illustrating the fact that the magnitude of the negotiated decrease in tariffs for a given good is proportional to its import volume. A more recent empirical contribution further substantiating this theory is Ludema and Mayda (2013).

international trade that gives them the leverage to effectively negotiate. The theory accentuates the point that large countries, defined as those that can influence world prices of some goods that they import, will have exercised their ability to externalize cost to their trading partners through their tariff schedule choices. Thus, these large countries that may have imposed externalities on each other can come to the table to negotiate down their tariff schedules and internalize some of these costs. As such, they manage to reach a mutually more beneficial equilibrium. In other words, a large country accords some 'control' over its tariff schedule to its trading partner that is also a large country. Hence, if the terms-of-trade theory indeed gives a solid account of what countries negotiate about, then we should expect to see more significant tariff cuts on goods in which the imposition of tariff-based externalities on large countries is greatest.

In order to test this hypothesis, I make use of import and tariff data from both the GATT and WTO years. I consider three developing countries that were marked off the US GSP list and compelled to engage in any meaningful concessions for the first time during the Uruguay Round. Based on regression analyses using data from these countries, I provide results that are in line with the terms-of-trade prisoner's dilemma hypothesis.

2.2   *Terms-of-trade Theory: Model*

In their model, Bagwell and Staiger (2011) demonstrate the theoretical relationship between changes in negotiation based tariff schedules on the one hand and the import demand and export supply elasticities as well as import volumes on the other. The model exploits these relationships to identify negotiators' goal of escaping from the terms-of-trade prisoner's dilemma through their GATT/WTO trade agreements. Here, I present the results from Bagwell and Staiger's (2011) model that guides the terms-of-trade prisoner's dilemma hypothesis testing methodologies.

Bagwell and Staiger (2011) hypothesize that tariff based cost-shifting to exporting trade partners is particularly salient when (i) the import demand elasticity is larger (ii) the export supply elasticity is smaller or (iii) the import volume is larger. In their theoretical framework, the authors produce a testable design of this hypothesis. First, the authors develop a structural design that exploits the relationship between negotiated tariff concession levels and import volumes. Subsequently, they reduce the model to a formulation with which one can test whether international trade negotiations aim to curtail tariff based cost-shifting to exporting trade partners.

More specifically, Bagwell and Staiger (2011) derive a relationship between the politically optimal tariff (τ^{PO}), the best response tariff (τ^{BR}), the number of product level units that the country has imported ($M(p(\tau^{BR}, \widetilde{p}^{wBR}))$), and the best response world price ($\widetilde{p}^{wBR}$) for any given product. In developing the economic environment, the authors first assume that the tariff imposing countries have linear demand and supply curves. Furthermore, it is assumed that the government puts a relatively higher weight on producer surplus when maximizing its welfare function. That is, the government's politically optimal tariff schedule is expected to be positive as it is influenced by its domestic producing sector's protectionist interest. In such an environment, with a possibility of non-reciprocal tariff negotiations they demonstrate that the following equation holds

$$\tau^{PO} - \tau^{BR} = \beta_0 + (\beta_1 - 1)\tau^{BR} + \beta_2 \big[\frac{M(p(\tau^{BR}, \widetilde{p}^{wBR}))}{\widetilde{p}^{wBR}}\big] \tag{1}$$

For any given set of products with constant terms-of-trade level (i.e. $r \equiv \frac{\widetilde{p}^{wPO}}{\widetilde{p}^{wBR}} = 1$, if a country's political economy environment and the demand and supply elasticities are the same, Bagwell and Staiger (2011) explain that the terms-of-trade theory predicts an estimated $\hat{\beta}_1 > 0$ and $\hat{\beta}_2 < 0$.

3. Identification Strategy

The hypothesis being tested is that the magnitude of the Most Favored Nation (MFN) based tariff reduction up to the post-negotiation bound level should be larger the higher the import volume for that particular good.[3] If so, the theory that countries negotiate to escape from the terms-of-trade prisoner's dilemma is not rejected.

The empirical design to test this hypothesis directly follows from equation (1), which, when rearranged, yields

$$\tau^{PO} = \beta_0 + \beta_1 \tau^{BR} + \beta_2 \big[\frac{M(p(\tau^{BR}, \widetilde{p}^{wBR}))}{\widetilde{p}^{wBR}}\big] \tag{2}$$

Thus, the estimating equation is as follows

$$\tau_{gc}^{WTO} = \beta_0 + \beta_1 \tau_{gc}^{BR} + \beta_2 m_{gc}^{BR} + \epsilon_{gc} \tag{3}$$

g refers to products indexed at the HS six-digit level, c refers to the negotiating country imposing the tariff, $m^{BR} \equiv \big[\frac{M(p(\tau^{BR}, \widetilde{p}^{wBR}))}{\widetilde{p}^{wBR}}\big]$, and ϵ_{gc} is the error term.

4. Data Description

The data that I use come from two main sources. For the disaggregated import data and bound tariff information, I use the United Nations Commodity Trade Statistics Database (UN COMTRADE) and WTO's Integrated database (IDB). Furthermore, I use the TRAINS (Trade Analysis and Information System) database that is maintained by the United Nations Conference on Trade and Development (UNCTAD) for both pre-negotiation and post-negotiation applied and bound tariff schedules. These sets of data are extracted from the World Integrated Trade Solution (WITS) as well as the WTO website directly.

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[3]The MFN principle is stated in the first paragraph of the original GATT article and stipulates that 'any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties.'

4.1   *Import Data*

UN COMTRADE data, which goes as far back as 1962, provides import data for both WTO member states and non-members at the country level for goods disaggregated at as low as the six-digit Harmonized System (HS) level. The database provides complete country level trading partner information. However, for the purpose of this study, it suffices to denote trading partners as the rest of WTO member countries.

The WTO IDB database contains import value data for all products and trade partners as reported by the importer and serves as the primary source of the trade data used in this study.

4.2   *Tariff Data*

For the traded goods, the relevant tariff schedules I use are both pre-negotiation unbound tariff levels that importing countries impose as well as their post-negotiation bound optimal tariff levels that in the model are referred to as the pre-negotiation best response tariff levels and the post-negotiation optimal tariff, respectively.[4] To the extent possible, the pre-negotiation unbound tariff collected are those levels that the importing country had imposed right before entering into any meaningful concession negotiation. As such, we can reasonably rule-out the likelihood that the differences in tariff schedules between the unbound and bound tariffs are driven by other changes in domestic or international economic dynamics.

Accordingly, in my analyses, I use data from the developing countries for which I had sufficient observation from the earlier part of the 1990s in the advent of the Uruguay Round completion. The pre-negotiation tariff schedule I use correspond to the applied level tariffs disaggregated at the six-digit level; which I obtain from the UNCTAD maintained TRAINS database. Finally, information on the 1996 bound tariff level are extracted from the WTO's IDB; which comprises both MFN applied and bound tariff data of the HS classification disaggregated at the six-digit level.

4.3   *Data Used in Regression Analysis*

In the results that I report below, the baseline OLS model I estimate is mapped directly from equation (3) as follows:

$$\tau_{gc}^{WTO} = \alpha_g + \alpha_c + \beta_1 \tau_{gc}^{BR} + \beta_2 [V_{gc}^{BR}] + \epsilon_{gc} \tag{4}$$

where τ_{gc}^{BR} indicates ad valorem tariff levels imposed on each product before concession agreements are entered into during the Uruguay Round and τ_{gc}^{WTO} indicates the post agreement tariff levels. g refers to the product indexed at the HS six-digit level, while c identifies the negotiating country imposing the tariff. α_g is the HS product level fixed effect for disaggregation ranging between the one-digit to the four-digit level, while α_c is a country fixed effect, included only for the full sample estimate. Finally, V_{gc}^{BR} is the pre-agreement import value of the traded goods in millions of dollars, and ϵ_{gc} is the error term.

Bagwell and Staiger (2011) make use of 16 countries that joined the WTO so as to have a clean data in which countries immediately drop their best response tariff

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[4]The post-negotiation bound tariff is presumed to be the optimal tariff based on the rationale that numerous rounds of negotiations in the GATT years have allowed contracting parties to gradually reach the tariff that will mutually maximize their gains from trade.

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schedule to the optimal WTO level. For this set of countries, they find evidence that the terms-of-trade theory does in fact play a significant role in the motivation for engaging in trade negotiations.

I make use of the same analytical approach to test if the terms-of-trade theory would still hold when applied to the three developing countries in my data that underwent significant tariff concessions during the Uruguay Round. By focusing on WTO entering countries, Bagwell and Staiger (2011) are able to avoid the gradual aspect of tariff concessions. Such a non-gradual drop in tariff concessions, while necessary for the analysis, rarely came about in the GATT years. In order to circumvent this problem, I proceed as follows. First, I focus on countries designated as developing countries and were granted GSP treatment by the United States. Subsequently, from this list of countries, I identify those that were taken off the GSP list by the US during the Uruguay Round and were compelled to negotiate and reduce their tariff barriers.

The countries that satisfy this stipulation are the following: Portugal, Romania, Hong Kong, Republic of Korea, Singapore, Paraguay, Bahrain, Brunei Darussalam, and Union of Myanmar. From this list of countries, I was able to obtain the necessary pre-WTO unbound tariff and trade data as well as the bound tariff data subsequent to the completion of the Uruguay Round for the following countries: Hong Kong, Republic of Korea, Singapore, Brunei Darussalam, and Paraguay. However, all of the unbound tariff for all products in Hong Kong are at 0 percent and virtually all unbound tariff data for all imports in Singapore are at 0 percent. Therefore, I cannot use these two countries for my empirical study to test the terms-of-trade theory within the framework of the model. I omit these two countries from my regression analysis. Thus, the analysis and results obtained are based on data obtained on the three remaining countries (i.e. Republic of Korea, Paraguay, and Brunei Darussalam). A more detailed information on the data from each country is provided in Table 1-2 below. In addition to their removal from the GSP list, the fact that I use developing countries that are ex ante different allows me to consider if the terms of trade theory can be extended to such heterogenous countries. For instance, Brunei is an oil rich country and heavily relient on it while South Korea was already experiencing high growth rates and is now considered a middle income country. Furthermore, the diversity in their geographic location, institutional structure and trade patterns may suggest that the findings are more broadly applicable.

It should be noted that while there is some level of coordination with other developed countries that have accorded GSP treatment (i.e. Japan, EU), it is unclear how effectively it is executed. If there is failure of coordination my results should be biased toward not finding support for the terms-of-trade theory. The fact that I do find some evidence despite the possibility of such a failure is reassuring.

Another possible concern with this approach relates to the issue of the ostensible fact that developing countries will inevitably have more to give to developed countries when they come to the negotiating table after having been removed from the GSP list, in the unlikely event that they were previously accorded an unconditional MFN treatment. The rationale for this assertion is that while developing countries were getting a free ride by being on the GSP list, developed countries such as the US were making reciprocal concessions vis-a-vis other developed countries and GSP non-beneficiaries. Thus, even once they are off the GSP list, the MFN benefits they have been getting for products not on the GSP list persists. However, the developing countries themselves have yet many concessions to give as they have not engaged in any substantial liberalization previously.

Thus, the question is, other than the goods on the GSP list, how much more do

developed countries have to offer in terms-of-trade liberalization with which these countries newly off the GSP list are incentivized to reciprocate. First, those goods removed from the GSP list are the primary focus of this exercise. Second, the fact that the Uruguay Round opened-up numerous other aspects of trade liberalization, including agricultural products as well as the phasing-out of the Multi-Fiber Arrangement, has given developing countries additional concessions to potentially bargain for and benefit from.

Finally, an omitted variable bias may be a concern in estimating the relationship between negotiated tariff reductions and import volume; especially in light of the fact that removal from the GSP list is the basis of selection. More specifically, there may be unobserved variables that affect both the countries' importing and negotiation behavior simultaneously and specifically for the transition period during which we observe the data. There may also be trend specific factors, such as country or industry level growth, that may introduce biases. I address these concerns in multiple ways.

First, the import data is at a disaggregated industry level and originating from multiple countries. Thus, the design is less likely to suffer from a bias based on the origination of the import. Second, the periods of observation for imports as well as both the pre and post negotiation tariffs are within a short period of time; the longest gap being four years. This approach allows for the exclusion of trend specific variations and mitigates the risk that confounding factors are introduced in the transitioning period. Finally, I also control for unobserved characteristics that may introduce cross country or industry variations in the estimation results. To do so, first, I use country and industry fixed effects in the overall results that I present. Second, I report the results both at the individual country and industry levels separately. As explained in detail below, most of the results are robust to these variations.

In Table 1, I report the list of countries in my sample, the year for which I have their import value data as well as their bound and unbound tariff data. The unbound tariff data is generated on the WITS website using the TRAINS Database as the source. The bound tariff data and import value data are generated on the WTO website using the Integrated Data Base (IDB). Import value are in millions of US dollars and tariffs are ad valorem. Table 1 shows (1) that the unbound tariff observations are from years that precede the bound tariff observations and (2) that the largest gap in years between the unbound tariff and bound tariff for any of the countries is no more than four years. While the former is a necessary condition for the model to work, the latter is important in that the short time duration between the two sets of observations allows for more precise estimations as time dependent trends in trade are less likely to influence the results.

Table 1. Countries in the Sample

Country	Year of Import	Year of Unbound Tariff	Year of Bound Tariff
Brunei	1992	1992	1996
Korea	1992	1992	1996
Paraguay	1994	1994	1996

In Table 2, I provide summary statistics for import values, unbound tariff, and bound tariff for the full sample. Furthermore, I provide summary statistics for the same variables for each of the countries in my sample separately. Again, the unbound tariff data is generated on the WITS website using the TRAINS Database

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as the source. The bound tariff data and the import value data are generated on the WTO website using the Integrated Data Base (IDB).

Table 2. Summary Statistics for Imports, Unbound Tariffs, and Bound Tariffs

Sample	Variable	Mean	SD	Min	Max	Observations
All	Imports	8.04	106.61	0.00	9548.44	10636
	Unbound Tariff	7.34	9.54	0	602.67	14961
	Bound Tariff	35.07	21.87	1	92	13660
Brunei	Imports	0.68	3.79	0.00	112.06	2157
	Unbound Tariff	2.42	11.01	0	602.67	5001
	Bound Tariff	28.19	13.08	1	69	4559
Korea	Imports	17.15	158.82	0.00	9548.436	4761
	Unbound Tariff	11.75	6.95	0	50	4942
	Bound Tariff	30.78	31.29	2	92	4543
Paraguay	Imports	0.65	3.94	0.00	137.63	3718
	Unbound Tariff	7.90	7.69	0	32	5018
	Bound Tariff	46.23	9.79	4	49	4558

5.   Results

As noted before, the terms-of-trade theory suggests that countries negotiate and enter into trade agreements in order to mitigate a terms-of-trade prisoner's dilemma by reciprocally reducing trade barriers. Accordingly, the model predicts that, ceteris paribus, the negotiation based reduction in the tariff level from the best response unbound tariff is higher when the trade value on that product is higher. Thus, the bound tariff on any given product to which a negotiating country agrees is expected to be decreasing relative to the noncooperative tariff level as the import value of the product increases.

In the baseline regression, as explained in the presentation of the model, we would expect to get a positive β_1 and a negative β_2 if the results are to conform to the predictions of the model. As shown in Table 3, I find that most of the statistically significant results and all of the country level regression results are in line with this theoretical prediction. For these baseline results, the top row of Table 3 gives the regression results for the full sample with both country fixed effects and industry fixed effects at the one-digit level. On the full sample, I do obtain a positive β_1 and a negative β_2 as the theory would predict. Furthermore, the results for the individual countries with industry fixed effects at the one-digit level is consistent with the theory prediction. Seven of the eight results are statistically significant at the 1 percent level. And, one of the results (i.e. the β_1 coefficient for Korea) is statistically significant at the 5 percent level.

For the industry one-digit level regressions with country fixed effects, the results are mixed. I observe positive β_1 coefficients for 9 out of 10 of the results; six of which are statistically significant at the 1 percent level. Only HS7 has a negative β_1 and it is statistically significant.[5] On the other hand, I observe negative β_2 for three industries (i.e. HS2, HS3, and HS6). For HS3, the result is not statistically significant.

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[5]For the one-digit level, the designation of the HS0-HS9 and their describtion in Table 3 corresponds to the different categories of products as assigned by the Harmonized System code at the higest level of aggregation. A list detailing what the different HS product categories at the one-digit level comprise is provided in Appendix B.

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Table 3. Baseline Results

Equation: $\tau_{gc}^{WTO} = \alpha_g + \alpha_c + \beta_1 \tau_{gc}^{BR} + \beta_2 [V_{gc}^{BR}] + \epsilon_{gc}$

Sample	Observations	β_1 (S.E.)	β_2 (S.E.)	R^2
Panel A: One-digit level				
All	9695	0.480 (0.046)**	-0.004 (0.001)**	0.26
Brunei	1979	0.685 (0.208)**	-0.270 (0.091)**	0.28
Korea	4291	0.178 (0.079)*	-0.006 (0.002)**	0.46
Paraguay	3425	0.095 (0.021)**	-0.569 (0.160)**	0.06
HS0: Live Animals; Animal Products	524	0.673 (0.146)**	0.101 (0.048)*	0.19
HS1: Vegetable Products	411	0.268 (0.176)	0.012 (0.018)	0.25
HS2: Prepared Foodstuffs; Beverages; Tobacco	1354	0.002 (0.070)	-0.009 (0.002)**	0.48
HS3: Products of the Chemical or Allied Industries	873	0.964 (0.148)**	-0.177 (0.100)	0.42
HS4: Rubber; Plastic; Skins and Leather	585	0.397 (0.095)**	0.005 (0.017)	0.56
HS5: Silk; Wool; Cotton; Textile Articles	899	0.337 (0.092)**	0.027 (0.014)*	0.58
HS6: Textile; Textile Articles; Clothing Accessories	1081	0.258 (0.026)**	-0.963 (0.243)**	0.41
HS7: Glass; Precious Stones; Precious Metals	891	-1.045 (0.184)**	0.023 (0.030)	0.49
HS8: Tin; Base Metals; Tools; Electrical Machinery	2222	0.021 (0.136)	0.017 (0.016)	0.32
HS9: Instruments; Furniture; Arms; Accessories	855	0.331 (0.089)**	0.187 (0.052)**	0.24
Panel B: Two-digit level				
All	9695	0.596 (0.042)**	-0.003 (0.001)**	0.33
Panel C: Three-digit level				
All	9695	0.604 (0.044)**	-0.0029 (0.001)*	0.35
Panel D: Four-digit level				
All	9695	0.645 (0.05)**	-0.0015 (0.0014)	0.47

* $p < 0.05$; ** $p < 0.01$. Standard errors are in parentheses. OLS are heteroskedasticity-robust. α_g indicates up to four-digit HS sector level fixed effects. α_c indicates country level fixed effects. τ_{gc}^{BR} indicates products level ad valorem tariff levels imposed before concession agreements are entered into during the Uruguay Round, while τ_{gc}^{WTO} indicates the post agreement levels. V_{gc}^{BR} is the pre-agreement import value of the traded goods in millions of dollars. ϵ_{gc} is the error term.

In order to estimate the model with HS codes closer to the tariff line, I also conduct analyses using higher levels of industry disaggregation on the full sample. As reported in the last three rows of Table 3, when I further disaggregate the industry fixed effects to the two-digit, three-digit and four-digit level, the results for the baseline regression remain the same in both magnitude and sign. All the result at each levels of disaggregation are statistically significant, except for the β_2 on the four-digit level fixed effect.

Furthermore, the magnitude of the coefficients are similar to what Bagwell and Staiger (2011) report in their paper. As Bagwell and Staiger (2011) note, it is not evident how to meaningfully interpret the quantitative significance of the estimates. However, the results on the β_2 estimate in the baseline OLS allow us to predict that a ceteris paribus increase in the value of the noncooperative imports by a standard deviation on the full sample would reduce the bound tariff levels by about 1.2 percent (compared to about 1.7 percent for Bagwell and Staiger (2011)). Even

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when the analysis is extended to the Uruguay years focusing on three developing countries analyzed here with country and industry fixed effects at various levels of disaggregation, the results that I obtain are in line with the predictions of the terms-of-trade prisoner's dilemma theory.[6]

In Table 4, I report my robustness check results. In these regressions, I also include a country-industry fixed effect starting at the one-digit level and incrementing up to the three-digit level of industry disaggregation. [7] I show that, on the full sample, my results conform to the predictions for all of the different specifications. That is, I find that β_1 remains positive for all of the regressions, while β_2 is consistently negative. Furthermore, all results are statistically significant and the magnitudes are all closely comparable to that of the baseline.

Table 4. Country and Industry Disaggregated Fixed Effects

Equation: $\tau_{gc}^{WTO} = \alpha_{gc} + \beta_1 \tau_{gc}^{BR} + \beta_2 [V_{gc}^{BR}] + \epsilon_{gc}$				
Sample	Observations	β_1 (S.E.)	β_2 (S.E.)	R^2
Panel A: One-digit level				
All	9695	0.227 (0.04)**	-0.006 (0.001)**	0.47
Panel B: Two-digit level				
All	9695	0.188 (0.035)**	-0.006 (0.0014)**	0.62
Panel C: Three-digit level				
All	9695	0.25 (0.029)**	-0.007 (0.003)*	0.26

* $p < 0.05$; ** $p < 0.01$. Standard errors are in parentheses. OLS are heteroskedasticity-robust. α_g indicates up to three-digit HS sector level fixed effects. α_c indicates country level fixed effects. τ_{gc}^{BR} indicates products level ad valorem tariff levels imposed before concession agreements are entered into during the Uruguay Round, while τ_{gc}^{WTO} indicates the post agreement levels. V_{gc}^{BR} is the pre-agreement import value of the traded goods in millions of dollars. ϵ_{gc} is the error term.

For Table 5, I consider HS2, HS3, and HS6, respectively. These are the one-digit industry level for which I get negative β_2 coefficients at the industry level. I analyze them individually to consider which country has greater weight in generating the negative results.

For HS2, at -0.175, the magnitude of β_2 for Brunei, is almost five time as high as that of Paraguay and more than five times higher than that of Korea. The β_2 results are statistically significant for both Brunei and Korea. As evidenced by the data in Table A5 of the Appendix, a large portion of Brunei's imports (e.g. Beverages & Tobacco, Mineral Fuels, and Chemicals) fall in the HS2 category. Similarly, data in Table A11 shows for years 1994 and 1995 that Korea has some goods as its principal imports that would be categorized in HS2 (e.g. Mineral Fuels & Lubricants, Chemicals, & Raw Materials.) Thus, it is consistent with the

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[6]It should be noted that although these countries could be potentially categorized as developing countries for the years I am considering, they are not meant to be representative samples. In order to highlight their idiosyncrasies, I provide relevant country profile information in the Appendix for each country.

[7]Additional level of disaggregation are not reported here as they create hidden collinearity concerns and give coefficients with missing standard error values.

theory that they would reduce their bound tariff more in these sectors in particular. However, I also get a statistically significant negative β_1 for Brunei contrary to the theory's prediction.

Table 5. Country Level Results for Select Industries

Equation: $\tau_{gc}^{WTO} = \alpha + \beta_1 \tau_{gc}^{BR} + \beta_2 [V_{gc}^{BR}] + \epsilon_{gc}$

Sample	Observations	β_1 (S.E.)	β_2 (S.E.)	R^2
HS2: Prepared Foodstuffs; Beverages; Tobacco				
Brunei	232	-0.220 (0.038)**	-0.545 (0.227)*	0.17
Korea	658	0.140 (0.102)	-0.008 (0.002)**	0.02
Paraguay	464	0.174 (0.066)**	-0.111 (0.068)	0.02
HS3: Products of the Chemical or Allied Industries				
Brunei	178	1.253 (0.079)**	0.228 (0.365)	0.59
Korea	363	3.212 (0.831)**	-0.127 (0.085)	0.05
Paraguay	332	0.355 (0.133)**	-0.192 (0.272)**	0.15
HS6: Textile; Textile Article; Clothing Accessories				
Brunei	290	1.808 (0.030)**	-0.214 (0.131)	0.94
Korea	419	9.516 (0.743)**	-0.596 (0.171)**	0.32
Paraguay	372	0.009 (0.010)	-0.121 (0.106)	0.01

* $p < 0.05$; ** $p < 0.01$. OLS are heteroskedasticity-robust. α indicates the constant term. τ_{gc}^{BR} indicates products level ad valorem tariff levels imposed before concession agreements are entered into during the Uruguay Round, while τ_{gc}^{WTO} indicates the post agreement levels. V_{gc}^{BR} is the pre-agreement import value of the traded goods in millions of dollars. ϵ_{gc} is the error term.

For HS3, I observe a negative β_2 that is statistically significant only for Paraguay. All β_1 results are positive and statistically significant at the 1 percent level. From Paraguay's primary imports in years 1994 and 1995 (detailed in Table A16), imports of "Chemicals" are reflected in what would be classified as HS3 goods.

Finally, for HS6, the greatest weight and the only statistically significant β_2 coefficient is observed in the results for Korea. It is negative and its magnitude is more than twice and four times as high as the Brunei and Paraguay coefficients, respectively. The β_1 coefficient for Korea is positive and statistically significant. However, at 9.516, it is remarkably higher than all of the other β_1 coefficients that are generally < 1. Furthermore, Korea's principal import pattern summarized in Table A11 does not indicate that it is composed of much of the products in the HS6 category.

While the estimates from the full sample, even when the sectors are disaggregated at up to the four-digit level, further confirms the terms-of-trade theory and are statistically significant, the country and sector level estimates are less informative

and not clearly accounted for by the theory. However, the finding of such precise results substantiating the terms-of-trade theory at up to the four-digit level of disaggregation even using the full sample is certainly noteworthy.

6.   Conclusion

In this study, I present and explain frameworks to test the validity of the terms-of-trade based theoretical explanation for why countries enter into agreements using the GATT/WTO as a forum for negotiations. Then, I test the relevance of this theory using a structural model that predicts that negotiated tariff concessions are larger for products with higher total import value.

Based on my results using Uruguay Round trade and tariff data for three transitioning economies removed from the US GSP list, I find that my estimates support the predictions of the terms-of-trade theory relationship. This holds true even when I disaggregate the industry fixed effects up to the four-digit level or when I apply a country-industry fixed effect in the baseline estimation. The results at the individual country level are also in line with the predictions, although the results at the individual industry level analyses are less conclusive.

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Appendix A. Appendix: Country Level Description

Figure A1.: **Brunei**

Source: www.mapsopensource.com

Table A1. Macroeconomic Structure 1

Economic Indicators	1991	1992	1993	1994	1995
Real GDP Growth	1.5^a	-1.1	0.5	1.8	2.0^b
Consumer Price Inflation	1.6	1.3	4.3	2.4	6.0^a
Population '000	263^a	267.8	276.3	284.5	292.0^a
Exports fob US$ bn	2.5^a	2.4	2.3	2.2	2.4
Imports fob US$ bn	1.2^a	1.2	1.2	1.7	1.98
Exchange rate (av) Br$:US$	1.73	1.63	1.62	1.53	1.42

Source: EIU

[a] EIU estimates.

[b] Official estimate.

Table A2. Macroeconomic Structure 2

Origins of Gross Domestic Product (% of Total)	1991	1992	1993	1994	1995
Oil Sector				37.4	
Agriculture, Forestry & Fishing			3.2	2.6	
Mining & Manufacturing			37.3	3.2	
Construction			5.3	5.5	
Transport & Communications			5.1	4.9	
Wholesale & Retail Trade			10.8	10.0	
Community, Social & Personal Services			30.9	32.3	
GDP at Factor Cost Incl Others			100.0	100.0	

Source: EIU

Table A3. Trade Structure 1

Principal Exports (Br$ m)	1991	1992	1993	1994	1995
Crude Oil			1,786		1,476
LNG			1,591		1,561
Refined Products			122		111
Principal Imports (Br$ m)	1991	1992	1993	1994	1995
Electrical & Industrial Machinery	339				562
Road Vehicles	159				207
Iron & Steel	124				203

Source: EIU

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Table A4. Trade Structure 2

Principal Export Destinations (% of Total)	1991	1992	1993	1994	1995
Japan				50	56
UK				19	
ASEAN					22
South Korea					16
Thailand				10	
Singapore				9	
Taiwan				3	2
EU					1
Principal Import Origins (% of Total)	1991	1992	1993	1994	1995
Singapore				29	
ASEAN					50
EU					16
UK				19	
USA				13	9
Japan					9
Malaysia				9	
France				6	
Australia					3

Source: EIU

Table A5. Brunei's Trade Value (US$ m)

Imports cif	1991	1992	1993	1994	1995
Food	143.1	146.9	178.8	213.9	228.9
Beverages & Tobacco	26.6	33.5	33.1	39.4	47.1
Mineral Fuels	6.8	7.0	15.7	3.4	11.2
Chemicals	69.9	86.0	82.9	93.8	117.3
Manufactured Goods	305.0	334.8	372.8	412.3	641.4
Machinery & Transport Equipment	426.0	651.4	937.1	767.2	733.5
Total Including Others	1,112.8	1,483.1	1,890.6	1,807.8	2,088.9
Exports fob	1991	1992	1993	1994	1995
Mineral Fuels & Lubricants	2,389.3	2,285.6	2,165.9	2,010.0	2,221.8
Total Including Others	2,469.9	2,402.3	2,248.0	2,154.9	2,391.2

Source: EIU

Table A6. Brunei's Trade Direction (US\$ m)

Total Export fob	1991	1992	1993[a]	1994[a]	1995[a]
Japan	1,543		1,287	1,079	1,220
UK			414	416	182
South Korea	254				
Thailand	203		206	166	263
Singapore	165		196	189	203
Taiwan			61	56	46
Philippines	96				
Total Including Others	2,466		2,362	2,084	2,329
Total Imports cif	1991	1992	1993[a]	1994[a]	1995[a]
Singapore	245		698	897	1,612
UK	78		495	595	444
Japan	175				
USA	152		526	414	209
Malaysia	107		207	287	358
Total Including Others	1,111		2,600	3,124	3,490

Source: EIU

[a] DOTs estimate.

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Figure A2.: **Republic of Korea**

Table A7. Macroeconomic Structure 1

Economic Indicators	1991	1992	1993	1994	1995
GDP at Market Prices W '000 bn	215.7	240.4	267.1	306.0	351.3
Real GDP Growth	9.1	5.1	5.8	8.6	9.0
Consumer Price Inflation	9.3	6.2	4.8	6.3	4.5
Population m	43.3	43.7	44.1	44.5	44.9
Exports fob US$ bn	69.6	75.2	81.0	93.7	123.2
Imports fob US$ bn	76.6	77.3	79.1	96.8	127.9
Exchange rate (av) Br$:US$	733.4	780.7	802.7	803.5	771.3

Source: EIU

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Table A8. Macroeconomic Structure 2

Origins of Gross Domestic Product (% of Total)	1991	1992	1993	1994	1995
Agriculture, Forestry & Fishing				7.0	6.5
Mining & Quarrying				0.3	0.3
Manufacturing				26.9	29.9
Electricity, gas & water				2.3	2.4
Construction				13.5	11.4
Trade, Restaurant, & Hotels				11.7	12.5
Transport, Storage, & Communications				7.4	7.9
Fiancial & Business Services				17.1	17.2
Government Services				7.9	5.8
GDP at Market Prices Incl Others				100.0	100.0
Components of Gross Domestic Product (% of Total)	**1991**	**1992**	**1993**	**1994**	**1995**
Private Consumption				53.8	52.9
Government Concumption				10.6	10.4
Fixed Capital Formation				35.9	36.6
Change in Stocks				0.1	0.5
Export of Goods & Services				30.1	33.2
Imports of Goods & Services				-30.9	-34.2
Statistical Discrepancy				0.4	0.6
GDP at Market Prices				100.0	100.0

Source: EIU

Table A9. Trade Structure 1

Principal Exports ($ m)	1991	1992	1993	1994	1995
Transistors, Semiconductors etc				11,848	19,373
Textiles & Fabrics				7,839	10,065
Passenger Cars					7,242
Ships & Floating Structures				4,945	5,533
Clothing & Accessories				5,652	4,958
Total Incl Others				96,013	125,058
Principal Imports ($ m)	**1991**	**1992**	**1993**	**1994**	**1995**
Machinery & Transport Equipment				37,408	49,437
Mineral Fuels & Lubricants				15,406	19,013
Chemicals				9,762	13,156
Raw Materials				9,405	11,713
Food & Live Animals				4,761	5,926
Total Incl Others				102,349	135,119

Source: EIU

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Table A10. Trade Structure 2

Principal Export Destinations (% of Total)	1991	1992	1993	1994	1995
USA				21.4	19.3
Japan				14.1	13.6
Hong Kong				8.3	8.5
China				6.5	7.6
Germany				4.5	4.8
Principal Import Origins (% of Total)	1991	1992	1993	1994	1995
Japan				24.8	24.1
USA				21.1	22.5
China				5.3	5.7
Germany				5.0	4.9
Saudi Arabia				3.7	4.0

Source: EIU

Table A11. Korea's Trade Value (US$ m)

Imports of Selected Commodities	1991	1992	1993	1994	1995
Machinery & Transport Equipment			28,417	37,408	49,437
Measuring & Controlling Instruments			2,049	2,664	3,607
Mineral Fuels, Lubricants etc			15,053	15,415	19,013
Chemicals			8,235	9,763	13,156
Inedible Raw Material			8,870	9,405	11,713
Food & Live Animals			4,002	4,761	5,926
Total Including Others			83,800	102,348	135,119
Exports of Selected Commodities	1991	1992	1993	1994	1995
Total			82,236	96,013	125,058

Source: EIU

Figure A3.: **Paraguay**
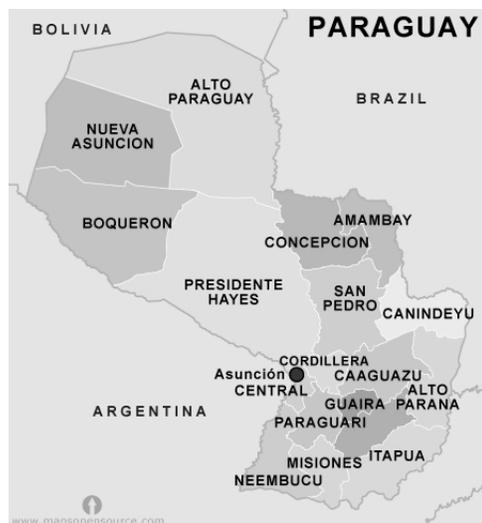
Source: www.mapsopensource.com

Table A12. Macroeconomic Structure 1

Economic Indicators	1991	1992	1993	1994	1995
GDP $ bn	6.2	6.4	6.9	7.8	9.0
Real GDP Growth	2.4	1.8	4.1	3.1	4.2
Consumer Price Inflation	24.3	15.1	18.2	20.6	13.4
Population m	4.4	4.5	4.6	4.8	4.9
Exports fob US$ m	1,121	1,082	1,500	1,871	1,992
Imports fob US$ m	1,868	1,951	2,711	3,148	3,350
Exchange rate (av) Br$:US$	1,325	1,500	1,744	1,912	1,970

Source: EIU

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Table A13. Macroeconomic Structure 2

Origins of Gross Domestic Product (% of Total)	1991	1992	1993	1994	1995
Agriculture, Forestry & Fishing				25.7	26.4
Mining & Quarrying				0.5	0.5
Manufacturing				15.1	14.8
Electricity, gas & water				4.8	5.3
Construction				5.4	5.4
Services				48.6	47.6
GDP at Market Prices Incl Others				100.0	100.0
Components of Gross Domestic Product (% of Total)	1991	1992	1993	1994	1995
Private Consumption				79.2	85.3
Government Concumption				6.8	7.2
Fixed Investment				22.5	23.1
Stockbuilding				0.2	0.9
Export of Goods & Services				36.4	34.8
Imports of Goods & Services				-45.7	-51.2
GDP at Market Prices				100.0	100.0

Source: EIU

Table A14. Trade Structure 1

Principal Exports ($ m)	1991	1992	1993	1994	1995
Soybean				216	181
Cotton				147	246
Timber				74	56
Meat				48	41
Principal Imports ($ m)	1991	1992	1993	1994	1995
Machinery				476	626
Vehicles & Parts				277	358
Beverages & Tobacco				179	328
Fuels & Lubricants				157	192
Chemicals				145	
Food					157

Source: EIU

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Table A15. Trade Structure 2

Principal Export Destinations (% of Total)	1991	1992	1993	1994	1995
Brazil				36.6	39.6
Netherlands				26.7	
Germany					7.3
Argentina				8.5	6.7
USA				5.9	4.7
Principal Import Origins (% of Total)	1991	1992	1993	1994	1995
Brazil				25.9	25.2
Argentina				14.4	11.0
USA				11.4	19.3
Japan				9.0	
Hong Kong					8.1

Source: EIU

Table A16. Paraguay's Trade Value (US$ m)

Imports	1991	1992	1993[a]	1994[b]	1995[b]
Food, Beverages & Tobacco			178.6	348.3	573.2
Petroleum & Products			147.2	187.2	191.0
Chemicals			100.2	275.7	283.8
Rubber Manufactures				56.6	63.9
Textile Fibers & Manufactures			44.4	57.6	64.6
Paper, etc & Manufactures			37.7	51.2	71.1
Iron & Steel & Manufactures			53.4		
Iron & Steel				38.5	40.3
Others Metals & Manufactures			19.4	68.4	75.5
Agricultural Implements			15.5		
Machinery & Transport Equipments			546.1	1,001.8	1,326.0
Electrical Apparatus			119.7		
Clothing & Footwear				51.7	70.7
Scientific Instruments				47.7	57.1
Total Including Others			1,477.5	2,424.6	3,135.9
Exports fob	1991	1992	1993	1994	1995
Oilseeds			226.7	224.8	194.2
Cotton, Raw			164.9	153.9	248.7
Total Including Others			725.2	816.8	819.6

Source: EIU

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Appendix B. Appendix: Industry Level Description

Table B1. **Industry Description by One-digit HS Sector**

HS	Description
0	Live Animals; Meat and Edible Meat Offal; Fish and Crustaceans, Molluscs and Other Aquatic Invertebrates; Dairy Produce; Birds' Eggs; Natural Honey; Products of Animal Origin, Not Elsewhere Specified or Included; Live Trees and Other Plants; Bulbs, Roots and the Like; Cut Flowers and Ornamental Foliage; Edible Vegetables and Certain Roots and Tubers; Edible Fruit and Nuts; Peel of Citrus Fruit or Melons; Coffee, Tea, Matte and Spices
1	Cereals; Products of the Milling Industry; Malt; Starches; Insulin; Oil Seeds and Oleaginous Fruits; Miscellaneous Grains, Seeds and Fruit; Industrial or Medicinal Plants; Straw and Fodder; Lac; Gums, Resins and Other Vegetable Saps and Extracts; Vegetable Plaiting Materials; Vegetable Products Not Elsewhere Specified or Included; Animal or Vegetable Fats and Oil and Their Cleavage Products; Pastrycooks Products; Preparations of Meat, of Fish or of Crustaceans, Molluscs or Other Aquatic Invertebrates; Sugars and Sugar Confectionery; Wheat Gluten; Cocoa and Cocoa Preparations; Preparations of Cereals, Flour, Starch or Milk; Prepared Edible Fats; Animal or Vegetable Waxe
2	Preparations of Vegetables, Fruit, Nuts or Other Parts of Plants; Miscellaneous Edible Preparations; Beverages, Spirits and Vinegar; Residues and Waste From the Food Industries; Prepared Animal Fodder; Tobacco and Manufactured Tobacco Substitutes; Salt; Sulphur; Earths and Stone; Plastering Materials, Lime and Cement; Ores, Slag and Ash; Mineral Fuels, Mineral Oils and Products of Their Distillation; Organic or Inorganic Compounds of Precious Metals, of Rare-Earth Metals, of Radioactive Elements of Rare-Earth Metals, of Radioactive Elements or of Isotopes; Organic Chemicals Bituminous Substances; Mineral Waxes; Inorganic Chemicals;
3	Other Colouring Matter; Paints and Varnishes; Putty and Other Mastics; Inks; Essential Oils and Resinoids; Perfumery, Cosmetics or Toilet Preparations; Soap, Organic Surface-active Agents, Washing Preparations, Lubricating Preparations,Artificial Waxes, Prepared Waxes, Polishing or Scouring Preparations, Candles and Similar Articles, Modelling Pastes, 'Dental Waxes' and Dental Preparations with a Basis of Plaster Albuminoidal Substances; Modi.ed Starches; Glues; Enzymes; Explosives; Pyrotechnic Products; Matches; Pyrophoric Alloys; Certain Combustible Preparations; Photographic or Cinematographic Goods; Miscellaneous Chemical Products; Plastics and Articles Thereof
4	Rubber and Articles Thereof; Raw Hides and Skins (Other Than Furskins) and Leather; Articles of Leather; Travel Goods, Handbags and Similar Containers; Saddlery and Harness; Articles of Animal Gut (Other Than Silk-Worm Gut); Furskins and Arti.cial Fur; Manufactures Thereof; Wood and Articles of Wood; Wood Charcoal; Cork and Articles of Cork; Manufactures of Straw, of Esparto or of Other Plaiting Materials; Basketware and Wickerwork; Pulp of Wood or of Other Fibrous Cellulosic Material; Waste and Scrap of Paper or Paperboard; Paper and Paperboard; Printed Books, Newspapers, Pictures and Other Products of the Printing Industry; Manuscripts, Typescripts and Plans; Articles of Paper Pulp, of Paper or of Paperboard
5	Silk; Wool, Fine or Coarse Animal Hair; Horsehair Yarn and Woven Fabric; Cotton; Other Vegetable Textile Fibres; Paper Yarn and Woven Fabrics of Paper Yarn; Man-Made Filaments; Man-Made Staple Fibres; Wadding, Felt and Nonwovens; Special Yarns; Twine; Cordage, Ropes and Cables and Articles Thereof; Carpets and Other Textile Floor Coverings; Carpets and Other Textile Floor Coverings; Special Woven Fabrics; Tufted Textile Fabrics; Lace; Tapestries; Trimmings; Embroidery; Impregnated, Coated, Covered or Laminated Textile Fabrics; Textile Articles of a Kind Suitable For Industrial Use
6	Knitted or Crocheted Fabrics; Articles of Apparel and Clothing Accessories, Knitted or Crocheted; Articles of Apparel and Clothing Accessories, Not Knitted or Crocheted; Other Made Up Textile Articles; Sets; Worn Clothing and Worn Textile Articles; Rags; Footwear, Gaiters and the Like; Parts of Such Articles; Headgear and Parts Thereof; Umbrellas, Sun Umbrellas, Walking-Sticks, Seat-Sticks, Whips, Riding-Crops and Parts Thereof; Prepared Feathers and Down and Articles Made of Feathers or of Down; Artificial Flowers; Articles of Human Hair; Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials; Ceramic Products; Glass and Glassware
7	Glass and Glassware; Natural or Cultured Pearls, Precious or Semi-Precious Stones, Precious Metals, Metals Clad with Precious Metal, and Articles Thereof; Imitation Jewellery; Coin; Iron and Steel; Articles of Iron or Steel; Copper and Articles Thereof; Nickel and Articles Thereof; Aluminum and Articles Thereof; Lead and Articles Thereof; Zinc and Articles Thereof
8	Tin and Articles Thereof; Other Base Metals; Cermets and Articles Thereof; Tools, Implements, Cutlery, Spoons and Forks, of Base Metal; Parts Thereof of Base Metal; Miscellaneous Articles of Base Metal; Nuclear Reactors, Boilers, Machinery and Mechanical Appliances; Parts Thereof; Electrical Machinery and Equipment and Parts Thereof; Sound Recorders and Reproducers, Television Image and Sound Recorders and Reproducers, and Parts and Accessories of Such Articles; Railway or Tramway Locomotives, Rolling- Stock and Parts Thereof; Railway or Tramway Track Fixtures and Fittings and Parts Thereof; Mechanical (Including Electro-Mechanical) Traffic Signalling Equipment of all Kinds; Vehicles Other Than Railway or Tramway Rolling-Stock, and Parts and Accessories Thereof; Airraft, Spacecraft, and Parts Thereof; Ships, Boats and Floating Structures
9	Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus; Parts and Accessories Thereof Clocks and Watches and Parts Thereof; Musical Instruments; Parts and Accessories of Such Articles; Arms and Ammunition; Parts and Accessories Thereof Furniture; Bedding, Mattresses, Mattress Supports, Cushions and Similar Stuffed Furnishings; Lamps and Lighting Fittings, Not Elsewhere Specified or Included; Illuminated Signs, Illuminated Name-Plates and the Like; Prefabricated Buildings; Toys, Games and Sports Requisites; Parts and Accessories Thereof; Miscellaneous Manufactured Articles; Works of Art, Collectors' Pieces and Antiques

Source: WITS and Bagwell and Staiger 2006.