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**M. MAHDI GHODSI  
JAN J. MICHAŁEK**

**TECHNICAL BARRIERS TO TRADE  
NOTIFICATIONS AND DISPUTE SETTLEMENT  
OF THE WTO**

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## **Technical Barriers to Trade Notifications and Dispute Settlement of the WTO**

**MOHAMMAD MAHDI GHODSI**  
Faculty of Economic Sciences  
University of Warsaw  
Department of Economic Sciences  
of Catholic University of Milan  
e-mail: mghodsi@wne.uw.edu.pl

**JAN J. MICHALEK**  
Faculty of Economic Sciences  
University of Warsaw  
e-mail: michalek@wne.uw.edu.pl

### **Abstract**

The aim of this paper is to verify to which extent and in which circumstances the TBT notifications can serve as a system of early warning for future disputes in the areas of TBTs. During 1995-2011 there have been 45 requests for consultations under the Dispute Settlement (DS) Body of the World Trade Organization (WTO) in order to identify the violations in technical barriers to trade (TBT) agreement. The DS Body decisions regarding violations of TBT agreement are discussed in this paper. The WTO members, in order to increase transparency of trade policy, made efforts to compile data on notified TBTs. WTO provides a TBT dataset that covers Specific Trade Concerns (STC) raised by its members. This paper attempts to find the linkages between DS cases citing TBT agreement and the STC data. We analyze descriptively and econometrically, the relationship between raising TBT STCs and DS cases on TBT.

### **Keywords:**

trade policy, technical barriers to trade, WTO, dispute settlement

### **JEL:**

F13, F53

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## 1. Introduction

Eight Multilateral Round of Trade negotiations under the GATT contributed significantly to the reduction of import tariffs among the World Trade Organization (WTO) members. However, non-tariff measures (NTMs) became relatively more important and have raised global attention. For example, Multi- Agency Support Team (MAST)<sup>1</sup> described NTMs as follows: “Non-tariff measures (NTMs) are policy measures, other than ordinary customs tariffs, that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both.” (MAST, 2008).

According to the latest classification of World Integrated Trade Solution (WITS) in February 2012, NTMs include 16 categories, First and the second categories that are the most frequently notified by WTO members are Sanitary and phytosanitary (SPS) measures, and Technical barriers to trade (TBT). According to WITS, TBTs are “measures referring to technical regulations, and procedures for assessment of conformity with technical regulations and standards, excluding measures covered by the SPS Agreement.”

The general aim of the TBT Agreement, concluded during the Uruguay Round, is to ensure that technical regulations and standards, as well as testing and certification procedures, do not create unnecessary obstacles to international trade. However, it is recognized that countries have the right to establish protection, at levels they consider appropriate, for example for human, animal or plant life or for health or environment protection. Countries should not be prevented from taking measures necessary to ensure those levels of protection are met. Therefore, the Agreement encourages countries to use international standards where these are appropriate, but it does not require them to change their levels of protection as a result of standardization.

As of 31 December 2012, there have been 454 requests for consultations filed under Dispute Settlement (DS) Understanding. Since 1995, TBT agreement has been cited in 45 WTO disputes. This is about one tenth of all disputes, showing the real trade significance of TBTs. It is worth to mention that in majority of cases of the DS, multiple agreements are cited. However, according to the WTO report (2012)<sup>2</sup>, out of 393 disputes related to trade of goods during 1995-2011, TBT have been cited in 10.2 percent of them, which is the fifth agreement in terms of number of citations.

Thus, there have been 45 requests for consultations to the DS Body citing the TBT Agreement. Most of those consultations have been requested because – according to the complainant - the imposed measures have been creating unnecessary obstacles to trade.

Maskus et al. (2000) analyzed briefly DS requests during 1995-2000 citing TBT and SPS agreements. Their analysis focused on the new standards and regulations and their importance for international trade. There are already many studies analyzing economic implications of some TBT and SPS measures. In some cases, the authors demonstrate that the drastic disruption of trade flows resulting from the imposition of “legitimate” higher standards. For example, Otsuki et al. (2001) analyzed the impact of the EU new safety aflatoxin standards on the importation of food products from Africa. Their analysis showed that this new regulation has decreased the health risk by 1.4 death per billion a year, while it reduced the import from

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<sup>1</sup> (MAST) as of July 2008 comprise institutional members: Food and Agriculture Organization of the United Nations (FAO), International Monetary Fund (IMF), International Trade Centre UNCTAD/WTO (ITC), Organization for Economic Cooperation and Development (OECD/TAD), United Nations Conference on Trade and Development (UNCTAD), United Nations Industrial Development Organization (UNIDO), World Bank (WB), World Trade Organization (WTO). Observers: European Commission (EC), and United States International Trade Commission (USITC), United States Department of Agriculture (USDA). UNCTAD and World Bank jointly coordinate MAST. MAST reports to the Group of Eminent Persons, which is convened by the director general of UNCTAD.

<sup>2</sup> Table C.4 of the report, page 111.

African countries by 64%, i.e. about 670 millions of US dollars. The authors argue that this substance rarely causes death in developed countries. They did not find any conclusive scientific evidence for the relationship between the aflatoxicosis and the amount of alatoxin intake. Their main perception of the more rigorous EU regulation was that its costs imposed to the developing countries are much higher than the benefits in the EU.

Aisbett and Pearson (2012) present another interpretation of TBT's and SPS measures. In an empirical analysis, they demonstrated that countries imposing SPS regulations are acting in the good faith. They showed that smaller tariff-binding overhang causes higher probability in imposition of new SPS measures. Moreover, they argue on the basis of econometrics results that high environmental standards, healthcare, and institutional governance qualities are the main factors affecting the imposition of SPS. While other countries facing NTMs perceive them as protectionism measure, the imposing country is actually imposing in good faith to protect human health, safety and other environmental qualities.

The issue of complementarity or substitutability between tariffs and NTMs has been emphasized in the literature. Ray (1981) found the causal relationship from tariffs to NTM in the US, meaning that NTMs are supplements for tariffs. Yu (2000) provided a theoretical framework to show the substitutability of NTMs for tariffs. Kono (2006) showed that most democratic countries, try to implement opaque and complex NTMs instead of simple tariffs in order to hide their policies from public. Feinberg and Reynolds (2007) confirmed the substitutability of tariff by antidumping measures. They found that tariff reductions after WTO agreement during 1995-2004 increased the likelihood of usage of antidumping protection by governments. Moreover, their results suggested that reduction of tariffs increased the number of petitions for this NTM measure filed by WTO member states. Results of Moore and Zanardi (2011) suggested the substitution of antidumping for tariff reductions only in developing countries who have become heavy users of this NTM measure.

A literature review on standardization effects was done by Swann (2010). Basing on many econometric studies, he argues that the use of international standards in a given country usually increases exports from and imports into that country. On the other hand, the use of national standards in a given country increases its exports, but the implications for imports into that country are less clear. In some cases, standards can facilitate imports, but in other cases, standards restrict such imports. In the case of Sanitary and Phyto-Sanitary (SPS) the national standards are more likely to restrict imports; especially those from developing countries. Complex nature of TBTs does not always allow finding the true motivation behind their implementation. Despite declared official motivation and consequent trade effects of TBTs, it is not always possible to prove whether or not they are in accordance with the TBT Agreement.

Recent efforts of international organizations to provide databases on these measures improve the transparency of NTMs. Santana and Jackson (2012) reviewed the inventories and instruments to identify issues affecting trade such as NTMs. They found GATT and WTO disputes as proxies of NTMs to forecast their future impositions. Specific Trade Concern (STC) database compiled by the WTO secretariat is one of the most important instrument increasing trade policy transparency.

In this paper, we will analyze the STC database and try to find possible relationship between DS held on TBTs and STCs. In particular, we will verify whether the TBT notifications can serve as system of early warning for future disputes involving TBT Agreement. The structure of the paper is as follows: In the next section, we will elaborate the importance of transparency issues in the WTO agreements. In the third section, the detailed description of TBT STC data will be provided. The fourth section describes the relationship between DSs and the TBT data. In the fifth section, we will provide an econometric analysis to find the linkages between raised TBT STCs and DS cases citing TBT agreement. Finally, in the fifth section, the conclusions will be presented.

## 2. Transparency in imposition of TBT

The Preamble to TBT Agreement states: "no country should be prevented from taking measures necessary to ensure the quality of its exports, or for the protection of human, animal, and plant life or health, of the environment, or for the prevention of deceptive practices, at the levels it considers appropriate". However, "Members shall ensure that technical regulations are not prepared, adopted or applied with a view to, or with the effect of, creating unnecessary obstacles to trade." (Article 2.2).<sup>3</sup> Therefore the flexibility in introducing restrictive TBT measures is - in principle - limited. Technical standards are often introduced to protect interest of consumers (for health, safety or environmental reasons etc.), but they can also restrict the volume of international trade, as foreign suppliers might not be able to comply with the country's regulatory framework. Such restrictions on foreign competition may decrease welfare by allowing domestic firms to charge higher prices and by reducing the volume of trade.

In principle unnecessary obstacles to trade can result when (i) a regulation is more restrictive than necessary to achieve a given policy objective, or (ii) when it does not fulfill a legitimate objective. A regulation is more restrictive than necessary when the objective pursued can be achieved through alternative measures, which have less trade-restricting effects, taking into account the risks non-fulfillment of the objective would create.<sup>4</sup> The obligation to avoid unnecessary obstacles to trade applies also to conformity assessment procedures (Article 5.1.2). An unnecessary obstacle to trade could result from stricter or more time-consuming procedures than are necessary to assess that a product complies with the domestic laws and regulations of the importing country.

There can be three main arguments for imposition of regulatory measures. Firstly, TBT can serve as an instrument of public policy aiming at protection of human health or safety, animal or plant life or health, or the environment. Secondly, from an economic point of view, TBT might focus on the increase of social welfare, in the case of market failures, without implementation of discriminations in trade. For instance, mandatory labelling of the products, a sub-category of TBT, will provide better information to consumers and other suppliers in the market, which can improve efficiencies of the market. Consequently, this will lead to the rise of social welfare, while it might incur some costs to the supplier facing the regulation. Thirdly, the TBT measure can be caused by a political economy motivation, i.e. it can create an unnecessary obstacle to trade in order to protect special domestic interest groups, and potentially reduce the social welfare. The first two reasons are expression of good faith of governments and are accepted by the TBT agreement. The last approach hampers trade and violates the articles of TBT, SPS, and other agreements of WTO.

In developed countries, almost all tariff lines are bound within the schedules of concessions and duties cannot be raised to increase the level of protection. On the other hand, higher technical standards can be implemented and in this manner, they might protect the domestic industry capable to meet higher standards, relative to foreign industries. However, sometimes it is fairly difficult to find out whether or not a given TBT is in line with the TBT Agreement. In other words, neither aims of the TBT declared by the imposing governments, nor its trade effects can provide a conclusive legal judgment. It is worth adding that according to the WTO regulations, governments should be transparent in all trade policies they impose. It can happen that governments might satisfy the special interest of lobbying groups by concealing the protectionist policy instruments behind TBTs. In order to realize the trade discriminative characteristics of these policies, thorough analyses should be carried out.

Asymmetric information is one of the major causes of market imperfections. According to Geraats (2002), transparency decreases asymmetry of information in the market. Thus, the

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<sup>3</sup> Results (The) of the Uruguay Round (1994), TBT Agreement, p. 139. All other citations of TBT Agreement come from the same source.

<sup>4</sup> Articles 2.3 and 2.4 of TBT Agreement

efficiency of the international market can also be increased due to the symmetry of information. TBT and SPS Agreements explicitly require high level of transparency and require that member states shall set up “enquiry points” providing information on technical regulations. WTO Members should also notify any new technical regulation, standards, and conformity assessment procedures to the WTO Secretariat. They shall also inform about international agreement involving these issues. The number of relevant notifications is several hundred each year, and about 25 per cent of them is conducted by the European Union.

The TBT Agreement explicitly encourages Members to use existing “international standards or relevant parts of them” for their national regulations, unless “their use would be ineffective or inappropriate” to fulfill a given policy objective. Technical regulations in accordance with relevant international standards “shall be rebuttably presumed not to create an unnecessary obstacle to international trade” (Article 2.5). Similar provisions apply to conformity assessment procedures: international guides or recommendations issued by international standardizing bodies, are to be used in national procedures for conformity assessment unless they are “inappropriate for the Members concerned, *inter alia*, such reasons as national security requirements, ... protection of human health or safety, animal or plant life or health, or protection of the environment, ... fundamental technological or infrastructural problems”<sup>5</sup>.

Thus, the concept of transparency is well defined in the TBT Agreement and is one of the key principles governing the WTO system<sup>6</sup>. “WTO agreements also include multiple provisions aimed at improving the transparency of policy measures affecting trade. These provisions can be grouped into the following four categories: (a) publication requirements; (b) notification requirements; (c) the Trade Policy Review Mechanism and the monitoring reports; (d) the possibility of raising specific trade concerns (STC) in the SPS and TBT committees and in the dispute settlement mechanism (DSM).”<sup>7</sup> These provisions increase the transparency of TBTs maintained by the member states. However, governments pursuing political economy goals, aiming at supporting interest groups, can be reluctant to notify new measures. In such a case, WTO regulations allow member states to raise specific trade concerns on measures maintained by other countries. For example, exporters facing new obstacles to trade usually inform their government and ask for support in the framework of WTO. Thus, even if a TBT measure is notified by a WTO member, other countries can raise concerns on those TBTs. In fact, STCs for TBT are a subset of all TBTs maintained by all WTO members. WTO has - in order to increase transparency - constructed a database on STCs of TBTs and SPSs. The STC features are presented in the next section.

### 3. Technical issues of TBT dataset of STC

WTO, World Bank and United Nations Conference on Trade and Development (UNCTAD) have recently combined their efforts to compile data on NTMs, and especially on TBTs and SPSs. This dataset should help governments and industries to be informed about measure applied at international markets and thus should increase the transparency and reduce market imperfections.

WTO members can discuss issues related to specific measures imposed by other members at the meetings of TBT and SPS committees. The STCs are “*reverse notifications*” that inform WTO secretariat about other members’ “concerns” regarding notified measures. WTO

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<sup>5</sup> (Article 5.4)

<sup>6</sup> The concept of transparency can have many attributes when applied to policy measures. According to Geraats (2002), transparency should be complete in the following steps: 1- ensuring the openness of policy; 2- references to economic, scientific, and technical aspects; 3- procedural and implementation transparencies; 4- publications and notifications of policy. In general, articles of GATT and TBT agreements oblige members to carry out all these steps for imposition of NTMs.

<sup>7</sup> World Trade Report 2012, page 96

Secretariat has compiled the data for all of the concerns related to TBT and SPS from 1995 to 2011<sup>8</sup>. We focus our attention on TBTs, included in the TBT dataset of STCs. The data has been compiled from two sources: TBT Committee minutes that cover STCs and WTO notifications that include all direct notifications made by imposing countries. When the information from both sources is not equivalent, the one from TBT Committee's minutes is preferred and included in the dataset. This data contains 12,426 observations<sup>9</sup> for 317<sup>10</sup> notifications over various types of products (tariff lines at two to six-digit level of the Harmonized System revision 2). All 317 STCs are treated as the first (original) source, and only 251 of them are included in WTO notifications (secondary source). In fact, for 66 cases, countries imposing TBT were reluctant to notify WTO and trade partners informed WTO instead. Some data on products, on which the concerns are not raised but the measure was imposed, were not listed in the database. In other words, the STC data covers products on which the concern were raised and not the products on which the TBTs were introduced. Therefore, it does not cover all TBT measures, but only those related to STCs. Thus, the TBTs imposed in line with TBT Agreement and not creating unnecessary obstacles to trade are presumably not included in the STC database.

The number of observations for each STC can show how many products are covered by the notified TBT. This can be used as an indicator of TBT trade coverage. For example, the STC item number 88 includes a huge number of products. Under this STC, 1,424 observations are covering 178 chemicals and goods using chemicals products (at four-digit level of HS2). Each product is in fact repeated 8 times and main characteristics are the same, except for the STC notification type symbol and notification number (provided by WTO notification source). In other words, under this item, there are 8 STC symbols and 3 notification numbers for each product, and all other things, like the TBT Committee minutes' description, are similar. It means that in this case several countries raised concerns on the same measures several times. Thus, we have to bear in mind that in this case all concerned WTO members are listed in 8 separate observations, for each product. This is a serious disadvantage of the STC dataset that repeats the similar concerns (observations) from different sources, which makes the whole database artificially large and less suited for comparisons. We shall also mention that different STC symbols and notification numbers can in principle be fitted in one observation of each product when all concerned members are also fitted in one observation.

Table 1 shows the example of item number 88 of STC database. This item covers only Fluorine, chlorine, bromine and iodine products (HS code no. 2801) among other 177 products covered by the item 88. Out of 29 columns of the STC data, only 5 columns have been presented in this table. As it is observed, three columns (i.e. Item, no., STC Notif Type Symbol 2 and HS Code (Rev. 2)) are exactly the same, while there are differences only in the third and the fourth columns. In fact, only two columns out of all 29 columns in the STC data are not similar. That is why there are 8 observations for one product in this item<sup>11</sup>. Because of this monotonous repetition, the STC data is not very well suited for the economic analysis. However, if all the data are corrected in a simple way as it is shown in the sample of item

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<sup>8</sup> The data is available at: [http://www.wto.org/english/res\\_e/publications\\_e/wtr12\\_dataset\\_e.htm](http://www.wto.org/english/res_e/publications_e/wtr12_dataset_e.htm)

<sup>9</sup> Each observation refers to a row of the database that represents the product in the focus of STC raised by various countries (concerned ones) for a specific TBT imposed by another (maintaining) country. Each observation also covers different information such as dates the STC was raised, notification numbers and symbols, classification of the TBT, and some other descriptive issues of the minutes recording.

<sup>10</sup> The data shows 318 STCs, while item 220 is missing in the data; thus, there exists only 317 STCs. Item number 220 does not exist in TBT Information Management System of WTO. According to the description of the STC data, item 220 has been deleted because it was of a duplication of item no. 219.

<sup>11</sup> It is possible to simply correct the data and remove the duplications for such problem represented in table 1. First, all different rows in the third and fourth columns can be summarized and fitted within one row (the same as what we have in the shaded row at the bottom of table 1). Then, duplicated rows (white rows) need to be removed and finally the last row with one observation will be remained.

number 88, the quality of the data can be higher, as each observation would focus only on the product on which the concern is raised.

**Table 1- Sample of item number 88 of STC data for product code 2801**

1	2	3	4	5
Item No.	STC Notif Type Symbol 2	STC Notif Type Symbol	NOTIF_NO	HS Code (Rev. 2)
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/52	40090	2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/52/Rev. 1		2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/295	92925	2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/297	93368	2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/333		2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/334		2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/335		2801
88	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6	G/TBT/N/EEC/336		2801
Correction	G/TBT/N/EEC/52 and Add.1-5; Add.3/Rev.1; G/TBT/N/EEC/295 and Add.1; G/TBT/N/EEC/297; G/TBT/N/EEC/333-6		40090, 92925, 93368	2801

Source: STC database on TBT and own corrections in the last row

As it was already mentioned, item no. 88 is one of the most important STCs as it covers a large number of products. Since 20 March 2003, the concern about this item has been raised 29 times by 34 countries. In this case, the European Communities are maintaining Regulation on the Registration, Evaluation and Authorization of Chemicals (REACH). The main concerns for other WTO members on this item regard: discrimination, further information, clarification, international standards, text, rationale, legitimacy, special and differential treatment, technical assistance, time to adapt, reasonable interval, transparency, unnecessary barrier to trade.

Table 2 shows top 10 countries (and groups of countries) maintaining TBT for which STCs were raised by other members most frequently (Full list of countries can be found in the Appendix, table 7). Among 43 groups of countries with STC on TBTs, the leaders were the European Union (EU) including its 27 members with 3138 observations covering 64 STCs, China with 1366 observations covering 39 STCs, and the United States with 1083 observations covering 35 STCs raised by other. According to the complete list (see the appendix), the developing countries are at the bottom of the list. World Trade Report 2012 comes to the same conclusion for the countries raising concerns. Thus, the developed countries are participating in the STC mechanism more frequently than developing countries in terms of maintaining or raising STCs. The econometric analysis in the 2012 Report shows that the trade coverage under these concerns is higher for developed countries rather than for developing ones. Moreover, the WTO Report states that developing countries are gradually increasing their participation in both activities.



Analyzing the product coverage of STC we shall note that the “Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80 % vol.; spirits, liqueurs and other spirituous beverages” (HS Code of 2208), with 126 observations, is the most frequent STC in the dataset. Since there are many products at four-digit level, below the aggregated products are studied at two-digit level.

**Table 2- 10 top countries (groups of countries) respondents of STCs raised by other members**

No	Member Maintaining	No. Obs.	No. STCs	No	Member Maintaining	No. Obs.	No. STCs
1	European Union	3138	64	6	Brazil	635	18
2	China	1366	39	7	Japan	198	11
3	United States	1083	35	8	Indonesia	613	10
4	Korea, Republic of	698	25	9	Mexico	509	9
5	India	642	18	10	Canada	177	9

Source: Own calculations from STC database

Table 3 shows the 10 most frequent products at two-digit level of HS2 on which STCs were raised. The complete table covering all products on which STCs were raised is illustrated in table 8 in the appendix. The order of the numbering of the groups of products are according to the decreasing number of STCs and then number of observations in the data. Beverages, Spirits and Vinegar products with code 22 at two-digit level are the most frequent product under the focus of STCs, which have been mentioned in the dataset for 543 times.

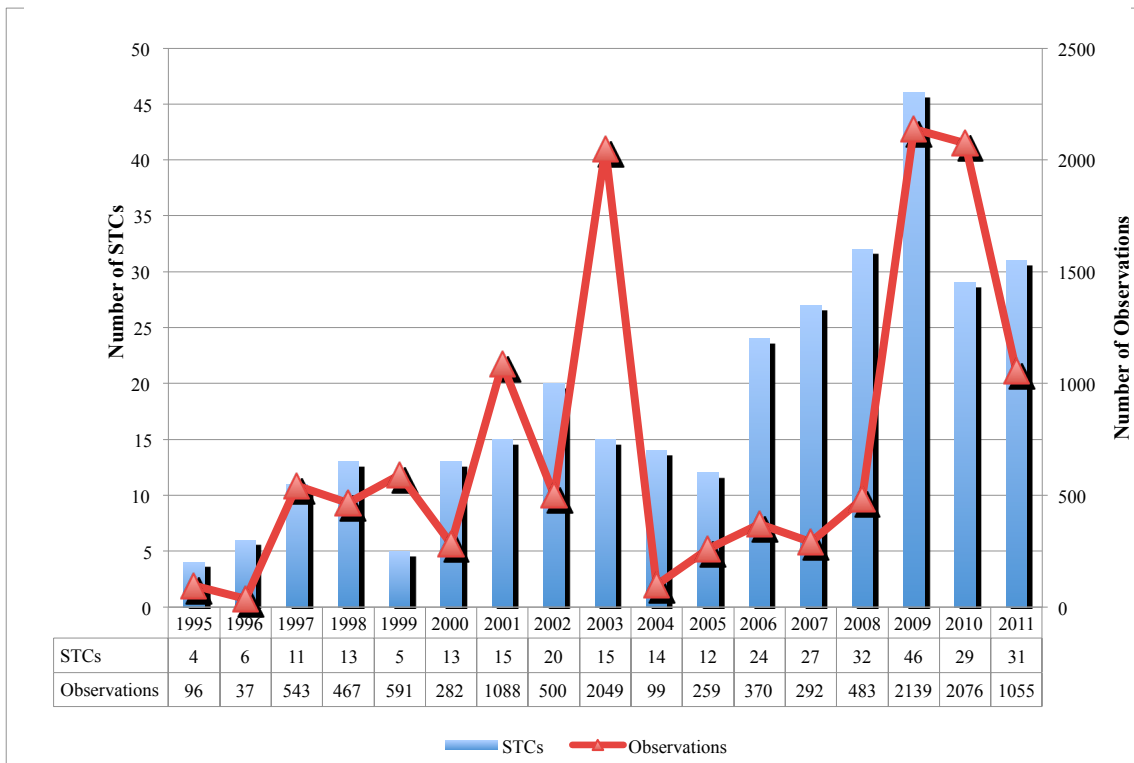
**Table 3- 10 most frequent Products at 2-digit of HS 2 level in the focus of STCs**

Rank	Codes	N. STC	N. Obs.	Rank	Codes	N. STC	N. Obs.
1	22	57	543	6	3	36	290
2	85	41	428	7	21	34	224
3	2	40	480	8	19	34	191
4	84	40	291	9	16	34	188
5	4	38	388	10	15	33	770

Source: Own calculations from STC database

Apart from product 22, it can be observed that food, beverages, and agricultural products are not the main issues of TBTs, but they consist the majority of top 10 most frequent products in the focus of TBT STCs. The second product in Table 3, with HS Code 85, includes “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”. This shows that STCs are also maintained for technical reasons and not only for health and safety issues. HS-Codes 02, 03, 04, 15, 16, 19, 21, and 22 are food related products as mentioned in the STC data description. HS-Code 84 includes all products related to nuclear

**Figure 1- Trends of STCs and Observations in the data raised by members**



Source: STC database

reactors, boilers, machineries, and some mechanical appliances. Thus, there is a broad variety of products, representing high or low technology that can raise concern of WTO members. However, as the bottom of the list in the appendix shows, agricultural products are more in the focus of TBT STCs.

Figure 1 presents the trends of STCs (items) and numbers of related observations (rows) for each year<sup>12</sup>. It reveals the upward trends of STCs in the periods 1995-1998, 1999-2002, and 2005-2009, while there were sudden or gradual decreases out of these periods. In general, there was an increasing trend of concerns raised by WTO members. Trends in the number of observations demonstrate a similar pattern to the STC trends, but in some years, this pattern did not coincide. Thus, there is no clear correlation between STCs and number of observations, because of frequent repetitions in some STCs. However, despite data misspecification that is due to the multiple inclusion, STCs with large number of observations in the data can cover a great number of products. This can mean that STCs with great coverage of products have bigger effects on trade.

According to figure 1, there was a sudden increase in the number of STCs and observations after 2008. Recent financial crisis encouraged some governments to impose new NTMs for “emergency” reasons. These TBTs with a large coverage seem to have protectionist motivation behind that can effectively influence imports and they are called “emergency” measures according to the World Trade Report (2012)<sup>13</sup>. In fact, during the recent financial crisis some governments were probably tempted to impose NTMs such as TBTs to help domestic enterprises.

<sup>12</sup> It is worth to mention that in SPS STC data provided by WTO, dates that the STC cases were resolved were also mentioned, while there is no such information in TBT STC database. Therefore, some STCs on TBT might have been resolved during years, but it was not mentioned in the data.

<sup>13</sup> Page 80 of report

#### 4. Descriptive Analysis on the Linkages between Dispute Settlements and STCs

Dispute in WTO starts when a government of a member state believes that another member is violating one of the WTO agreements. The complaining member must identify the violated agreements and request for the consultation within DSM. If consultations do not allow solving the problem, a Member state will request to set up a panel. Since 1995, 45 cases have cited TBT Agreement in request for consultation<sup>14</sup>. In this section, we analyze those disputes and the linkages between them and the TBTs included in the STC.

Table 4 shows the summary of disputes in which TBT Agreement was cited. The disputes were geographically concentrated. Since 1995, only seven groups of countries have been the respondent of forty-five cases of DS, citing violation of the TBT agreement. The European Union (and its 27 members of WTO) more frequently than any other countries was respondent to DSs, for 20 times. It was already shown that EU countries were maintaining 64 STCs raised by others, which was the highest record among all members. While China was the second largest country maintaining of TBT STCs, there has been no one requesting for consultation against China in DSs. Thus, measures maintained by the Chinese government raised STC but did not seemingly violated TBT agreements and provoked no action regarding DS. In fact, these TBT measures implemented by China might have been imposed in good faith and there might have been be justifiable motivations behind them.<sup>15</sup>

United States of America is the second respondent for DSs for 11 times. South Korea is the fourth country in the imposition of STCs on TBT and the fourth member respondent for violation of TBT agreement for four times. Argentina, Australia, Mexico, and India are the rest of the WTO members responding for violation of TBT agreement within DSM. Among all of these 7 groups of countries, Australia maintained the lowest number of TBT STCs in the data.

**Table 4- Summaries of DS cases based on their respondents**

<b>Respondent</b>	<b>Cases</b>	<b>Resolved</b>	<b>Matched STCs</b>	<b>Cited TBT Art.</b>	<b>Average Length</b>	<b>Max Length</b>
<b>EU Countries</b>	20	14	11	2, 5, 6, 7, 8, 9, 12	4.6	14.6
<b>USA</b>	11	11	7	2, 5, 6, 7, 8, 12, 14	4.4	14.6
<b>Argentina</b>	4	2	1	2, 2.2, 5, 12	2.4	2.6
<b>South Korea</b>	4	4	4	2, 5, 6	3	6.2
<b>Australia</b>	3	0	3	2.1, 2.2	-	-
<b>Mexico</b>	2	1	0	1, 2, 5	2.7	2.7
<b>India</b>	1	0	1	2	-	-
<b>Total</b>	45	32	27	-	4.14 (total average)	

Source: WTO website and STC database on TBT

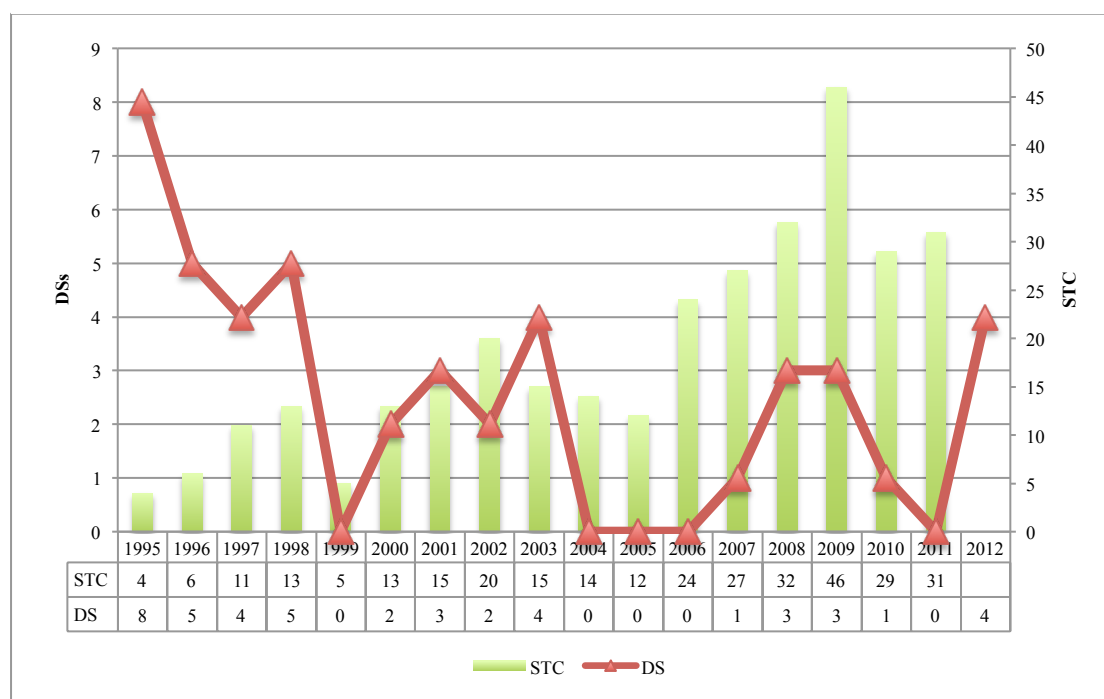
<sup>14</sup> These disputes are available at WTO website:

[http://www.wto.org/english/tratop\\_e/dispu\\_e/dispu\\_agreements\\_index\\_e.htm?id=A22#selected\\_agreement](http://www.wto.org/english/tratop_e/dispu_e/dispu_agreements_index_e.htm?id=A22#selected_agreement)

<sup>15</sup> There might be some reasons explaining this situation namely: Firstly, because China have implemented TBT measures on real grounds and on non-discriminative basis and have had no impact on trade flows; Secondly, because China is a very competitive country in the international market, the measures imposed have had no visible effect on imports to China - thus, countries exporting and are facing relatively minor problem and do not request for DS consultations.

#### 4.1. Matching DS cases with TBT data

Figure 2- Trends of DSs and TBT STCs



Source: STC database and WTO website

Figure 2 shows the trend of raised STCs in bars and that of DS cases in marked line. Before 1999, these two trends were moving in opposite directions. During 1995-1999, the number of new STCs has been gradually increasing, while DS cases were decreasing to zero. In 1999, 2004, 2005, 2006, and 2011, there were no requests for consultation in DSM citing TBT agreement. Since 1999 until 2011, these trends follow almost similar patterns. Santana and Jackson (2012) stated that the number of DS cases citing TBT agreements decreased along with all other DS cases during 1995-2011. In order to find the possible explanations of these patterns, the linkages between STCs and DSs on TBT will be analyzed in this subsection.

The STCs raised and DSs initiated are not following similar patterns during 1995-1998. Some of the DS cases have no “equivalents” in the STC database on TBT. Several possible explanations are possible: Firstly, dates on which DS cases have been requested are mostly different from those of the related STCs being raised. In some cases, STCs (e.g. DS144) were raised on a later date; Second reason for trends’ disparity can be that sometimes an STC is equivalently referring to multiple cases of DS (e.g. item number 304 is related to DS434, DS435, and DS441); Thirdly, sometimes, a reverse case can also be observed when a special case of DS refers to multiple items of STCs (e.g. DS135 is related to items number 12, 22, and 25); Fourthly, some TBT cases of DS are not included in TBT data but included in SPS data (e.g. DS5 and DS20 are related to item number 1 of SPS STC data; DS3 and DS41 are mentioned in item number 2 of that data); Fifthly, there are many disputes (18 cases) that have not been found in the data or in the online TBT Information Management System of WTO. They might not have been included in the data or have been suspended afterwards, because the complainants have withdrawn the requests (e.g. DS72, DS210, and DS232).

Some TBT complaints in DS cases have been rejected by DS findings, which means that there was no sufficient evidence for violations of TBT Agreement. In many cases the TBT Agreement has been cited in addition to some other agreements. Obviously, only after the

final acceptance of Panel and Appellate bodies' reports it is possible to conclude whether or not the TBT Agreement was violated. For instance, in DS56 the United States requested for consultation with Argentina citing some inter alia Article 2 of TBT Agreement. The Panel found violations of Article II and VIII of GATT<sup>16</sup> and did not of the TBT agreement. The Appellate Body upheld the Panel's findings. Thus, the citation of TBT agreement in request for a panel does not mean that there was a violation of TBT Agreement.

According to table 4, it is observed that more than two third of all cases have been resolved so far. Almost two third of these cases have been found in the STC data on TBT. Article 2 of TBT Agreement has been most frequently cited amongst all articles of the Agreement. Second column to the left shows the average time between the date of the consultation request and date of report acceptance. . It took about 4.14 years on average for disputes to be resolved. The last column of this table shows the maximum duration between consultation request and case resolution. According to this data, it took a long time to solve the cases in which the EU and the USA were involved; with some cases taking more than 14 years.

#### **4.2. Time consuming procedures of DSM**

A lengthy dispute procedure from the request for consultation until the DS resolution can be costly. Firstly, there are costs for the complainant countries exporting to the countries imposing TBT measures (costs of decreased exports). For instance, Canada requested for consultation with the United States in December 2008 (DS384) concerning certain mandatory country of origin labelling (COOL) provisions. "Meat of swine, fresh or chilled—carcasses and half carcasses" with HS code "020311" was one the products covered by this dispute.<sup>17</sup> During the procedures exportation of this product from Canada to the USA dropped from 13.68 million USD in 2007 to 5.12 million USD in 2008 and finally to 3 thousand USD in 2012<sup>18</sup>. After findings of the Dispute Settlement Body (DSB), USA made a commitment to implement the rulings until May 2013. Thus, until the date the dispute resolution there have been significant costs incurred by the Canadian exporters of swine meat.

Secondly, long lasting consultations impose a high cost to the DSB analyzing the case. For example in the extreme case of DS144, it took more than 14 years to be completed; an apparent similar case to DS384, in which violations of Article 2.1 of TBT agreement were concluded by the DSB. During this time the US was discriminating products imported from Canada in comparison to domestic like products, incurring high costs on trade for Canada, and costs of expertizes and analyses within DSB.

The Uruguay Round Agreement provides the timetable for dispute settlement mechanism. According to the schedule, from the time a case is requested for consultation, it should not take more than one year until the Panel's report becomes a ruling. If one side appeals, it should not take more than three months for the ruling of the Appellate Body (AB). However, the DSM Agreement has some flexibility and countries can resolve cases themselves through consultations at any stage.

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<sup>16</sup> According to WTO website: [http://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds56\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds56_e.htm), Appellate Body upheld Panel's report with some modifications including that: "The Panel found that the minimum specific duties imposed by Argentina on textiles and apparel are inconsistent with the requirements of Article II of GATT, and that the statistical tax of three per cent ad valorem imposed by Argentina on imports is inconsistent with the requirements of Article VIII of GATT."

<sup>17</sup> According to matched item in the TBT STC data, item number 91

<sup>18</sup> This data is collected from UN COMTRADE, available at: <http://comtrade.un.org/>

**Table 5- TBT DS cases and their total durations until final resolutions**

DS conclusion	No. DSs	DS Cases	Comments
In consultation without panel	8	137, 203, 233, 263, 279, 435, 441, 446	
In consultation but seems resolved	6	3, 41, 61, 100, 134, 144	DS3 and DS41 are resolved without panel establishment after more than 5 years (according to STC database on SPS). DS61 seems to be resolved after about 5 years with DS58 (according to WTO website <sup>19</sup> ). DS100 seems to be resolved with related cases like DS384 and DS386 after more than 14 years of its request. DS134 seems to be resolved after more than 3 years with DS210. DS144 seems to be resolved after more than 14 years along with the related cases DS384 and DS386.
In consultation after panel establishment	5	369, 389, 400, 401, 434	
Withdrawn without panel before 1 year	3	5, 20, 85	
Withdrawn after 1 to 2 years from request	5	7, 12, 14, 151, 210	DS7, DS12, and DS14 have been resolved by mutual agreements before Panel's report. DS7 mutual agreement took less than one year after the request was made.
Cases last from 2 to 3 years	10	72, 77, 232, 290, 2, 4, 56, 135, 231, 206	DS72, DS77, and DS232 were withdrawn before Panel reports. DS290 concluded by the Panel report. The rest of cases have been concluded by the Appellate report
Cases last from 3 to 5 years	4	291, 381, 384, 386	DS291 was resolved by Panel report after more than 3 years. The rest of cases were resolved by Appellate findings after more than three years, but the adaptation would take place after more than 4 years.
Cases last from 5 to 7 years	2	292, 293	These cases have been reached to mutual agreements after more than 6 years, but the Panel report was circulated after about 3 years the requests had been made
Cases last from 13 to 15 years	2	26, 48	DS26 and DS48 respectively reached to mutual agreements after more than 13 and 14 years, but the Appellate reports were respectively circulated after 2 and one and a half years after the requests had been made.

Source: WTO website and own analysis

Table 5 shows disputes with total duration until the final resolutions of the cases. There are still 8 DS cases in consultation, without establishment of a panel body. Second row of this table shows those cases that according to WTO website are still in consultation, but according to a deeper analysis, they seem to be resolved. As it is explained in the comment column, all these six cases took too long to be resolved<sup>20</sup>. Of course, long lasting consultations mean usually, that both sides of conflict are trying to reach an agreement and the nature of WTO rules violation is not obvious<sup>21</sup>. Last five rows show that there are also many DS cases with procedures lasting for more than one year. In some of these cases, the duration of adopting DSB findings was very long. For instance, the last row shows two cases responded by the EU

<sup>19</sup> Available at: [http://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds61\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds61_e.htm)

<sup>20</sup> It seems that these cases are resolved by analysis of linkages to the TBT and SPS datasets.

<sup>21</sup> It is worth mentioning that in the WTO website there is no updated information for those old cases.

in which Appellate Body circulated its findings within less than 2 years after the request had been made, and the implementation of the Appellate ruling took more than 12 years.

Thus, it appears that DSM is working less expeditiously in comparison to provisions in the Uruguay Round Agreement. There are only two DS cases (DS4 and DS2) leading to Appellate Body’s findings concluded within 15 months after the first request for consultation. Appellate Body circulated its findings for 5 cases between 15 to 24 months after the date the request has been made, among which two of them (DS26 and DS48) have been finally implemented after about 14 years from the date of request. The rest of the Appellate Body’s findings were circulated after more than about 3 years from the first requests for the consultations. It is worth mentioning that in addition to the significant costs incurred by the complainant countries by TBTs, there are important costs incurred by WTO Secretariat assisting DS bodies and carrying out detailed analyses.

### 4.3. Panel and Appellate Bodies’ Reports

In 28 out of 45 requests for consultation citing TBT agreement, complaining countries have requested for the establishment of a panel. For 25 of them panels have been established and for 19 of them panels circulated their reports. After Panel’s reports, 8 cases have concluded by mutual agreement between the parties. 11 other cases have led to the establishment of Appellate Body, because one party appealed certain issues in the Panel report. Appellate Body has already provided its findings for all 11 cases in listed in the reports<sup>22</sup>. Afterwards, parties have reached mutual agreements.

**Table 6- Violated Articles Approved by Panel or Appellate Body**

DS	Respondent	Concluded Violated Art.	DS	Respondent	Concluded Violated Art.
406	USA	2.1, 2.9.2, 2.12 TBT	72	EU	Withdrawal of Request
386	USA	2.1 TBT	56	Argentina	II, and VIII of GATT
384	USA	2.1 TBT	48	EU	3.3, and 5.1 of SPS
381	USA	2.2 TBT	26	EU	3.3, and 5.1 of SPS
293	EU	Annex C(1)(a), 8, 5.1, 5.5, and 2.2 of SPS	14	EU	Withdrawal of Request
292	EU	Annex C(1)(a), 8, 5.1, 5.5, and 2.2 of SPS	12	EU	Withdrawal of Request
291	EU	Annex C(1)(a), 8, 5.1, 5.5, and 2.2 SPS	7	EU	Withdrawal of Request
290	EU	Annex C(1)(a), 8, 5.1, 5.5, and 2.2 SPS	4	US	III:4 of GATT
231	EU	2.4 TBT	2	US	III:4 of GATT
135	EU	III:4 GATT			

Note: Shaded areas are the cases concluded by the Panel and white areas are concluded by the Appellate Body.

Source: WTO website

<sup>22</sup> As mentioned earlier, DS100 did not lead to the panel establishment, but it seems that it’s a similar case to DS384 that was concluded by the Appellate findings.

Table 6 shows the violations of WTO agreements confirmed by the final findings of Panel and AB's reports. When the procedure is sent to the Appellate Body after Panel report, final conclusions of AB should be adopted by the parties by the DSB, and not the Panel report. Cases in the left column have been found in the STC database on TBT. Only five out of 19 cases analyzed by Panel and/or AB have been proved violations of TBT agreement. Thus, amongst 45 DS cases citing TBT Agreement only 11 percent (5 out of 45) of them have been TBT violations. All five cases have been concluded by the Appellate Body. Those simple statistics demonstrate how complicated the evaluations of TBTs measure can be. DS231 covers only 3 observations, DS381 covers 13 observations, DS384 covers 28 observations, DS386 covers 34 observations, and DS406 covers only 1 observation from the TBT STC data. Even though the scope of trade flows covered by disputes includes a limited numbers of products, these DS cases were important for exporters of goods on which TBT measures have been imposed.

The principle of non-discrimination is one of the key provisions of GATT/WTO system included in the National Clause (Article III of GATT). Its equivalent in the TBT Agreement is Article 2.1 that states: "members shall ensure that in respect of technical regulations, products imported from the territory of any Member shall be accorded treatment no less favorable than that accorded to like products of national origin and to like products originating in any other country." When it is proved that this Article 2.1 is violated, it should be clarified whether or not the policy measure was introduced in pursuing protection of domestic industries rather than protection of human health, safety, animal or plant life, and environment, i.e. in accordance with WTO regulations. However, clear conclusions on this issue have been presented in only four cases out of 45 DS requests.

For example in the case of DS406 AB's report stated that the US violated articles 2.9.2 and 2.12 of TBT Agreement. It concludes that the imposition of the TBT measure by the US government violated transparency requirements. In order to maintain transparency, DS body recommended to the US to implement the Appellate Body's report. In addition to the above-mentioned four cases in which Article 2.1 has been violated, there have been other 14 requests for consultations under Article 2.1 of the TBT agreement. Panel has analyzed four of them<sup>23</sup> and found no violation of TBT agreement. Ten other cases have not been submitted to Panel and Appellate Body's analyses in order to find whether they were violations of this article. Seven of those cases are still in consultation and three others have been mutually agreed before submission of the Panel report. In the case of DS231, Appellate Body found that TBT maintained by EU are inconsistent with Article 2.4 and recommended to bring the measures into conformity with EC's obligations under this article. Thus, despite many arguments presented in the economic literature, there are only few cases in which a violation of non-discrimination principle was found by the DSM reports.

## 5. Econometric Analysis of Linkages between Dispute Settlements and STCs

As discussed in previous section, we found few direct linkages between the raised TBT STCs and DS cases citing TBT agreement. In this section, we will use econometrics to find evidence on such linkages. In other words, we will analyze the impact of TBT STCs on the occurrence of DS cases citing TBT agreement. To achieve this goal we use an unbalanced panel database gathered from three data sources encompassing all WTO members during 1995-2011. We consider the following equation to be estimated:

$$DS_{ijht} = \alpha + \beta_1 STC_{ijht} + \beta_2 SM_{ijht} + \beta_3 T_{ijht} + \beta_4 Y_{it} + \beta_5 Y_{jt} + \theta_i + \vartheta_j + \delta_h + \mu_t + \varepsilon_{ijht}$$

Where the dependent variable " $DS_{ijht}$ " is the number of DS cases responded by the reporter country " $i$ " that is complained by country (or third parties) " $j$ " on product " $h$ " at 2-digit level

<sup>23</sup> DS290, DS291, DS292, DS293



of HS at time “ $t$ ”. This variable is gathered from the WTO website covering all DS cases citing TBT Agreement during 1995-2011. This variable is a count variable that takes discrete values. Most of the DS cases are addressing a group of products that are correspondingly matched with HS rev. 2. The maximum value of this variable in the sample is 2, referring to DS3 and DS3 responded by the Republic of Korea, and to DS cases 290 and 291 responded by the EU<sup>24</sup>.

“ $STC_{ijht}$ ” is the TBT STC on product “ $h$ ” maintained by the reporter country “ $i$ ” raised by partner country “ $j$ ” at time “ $t$ ”, which is obtained from the database provided by the WTO secretariat.

“ $SM$ ” refers to the share of product imports from the partner country relative to the total imports of that product. In majority of the requests for consultations within DSM, complainant and third party countries are motivating their requests with the significant share of their exports within the total import of the respondent country. Therefore, it is expected to find a positive relationship between this variable and the occurrence of DS case. The data on bilateral imports of products is obtained from WITS website<sup>25</sup>.

“ $T$ ” stands for the average tariff imposed by the reporter country on all subcategories of 2-digit level of Harmonized System products imported from the partner country. Most favored nation (MFN) applied tariff rates are considered in the analysis obtained from WITS<sup>26</sup>.

Regulations imposed within TBT notifications are usually permanent rules affecting trade during long run. Similar hypothesis can be argued for tariff rates. Besides, share of imports or being a major exporter to a country in previous year can be motivated for the request of consultation. Therefore, in our analysis we also consider lag of these three variables in separate specifications.

Trade policy of a large country can have more significant implications than that one of a small country. Obstacles imposed by TBT regulations at the focus of a DS case can draw more attentions if the maintaining importer country is a large country. On the other hand, controlling for trade shares (“ $SM$ ” variable), a small country having fewer trade partners and facing a restrictive TBT regulation, can be more affected than a large country. Therefore, a small country is potentially more vulnerable to an unnecessary obstacle and motivated for an initiation of dispute. In order to control for the size of both trade partners, we include the real Gross Domestic Product (GDP) of the two countries. The data for GDP is collected from the World Development Indicator database provided by the World Bank<sup>27</sup>.

In the above estimation equation,  $\theta_i$ ,  $\vartheta_j$ ,  $\delta_h$ , and  $\mu_t$  are respectively possible reporter, partner, product, and time fixed effects, and  $\varepsilon_{ijht}$  is the error term. The database used is an unbalanced panel data. Since the dependent variable is a count discrete data, we apply Maximum Likelihood Poisson regression to achieve unbiased results. Moreover, due to heterogeneity of countries and products, there are possible fixed effect problems and heteroskedasticity within the error term. To control for these issues, we use Fixed Effect (FE) robust Poisson estimator to attain the most consistent unbiased regressions. Besides, the efficiency and consistency of FE estimator is tested using Hausman test. It is important to mention that FE Poisson regression will drop some observations of the dataset if no variation within the dependent variable is detected during the period. Firstly single observations within each group of individual (i.e. product-paired-country) are dropped. Secondly if there are no changes of the

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<sup>24</sup> There are some DS cases such as DS291, DS292, and DS293 for which only the complainant countries are different, while they are also third parties in the two other cases. Hence, such DS cases are considered in our analysis as one unique DS case. Therefore, the maximum value of DS variable is 2, meaning that for DS290 and DS291 (DS292 and DS293) there exist two cases responded by the EU for a specific product in 2003.

<sup>25</sup> Can be found at: <https://wits.worldbank.org/>

<sup>26</sup> Preferential tariff rates and Effectively Applied rates have been also tested giving similar results.

<sup>27</sup> Can be found at: <http://data.worldbank.org/data-catalog/world-development-indicators>

dependent variable within a specific group during the period, the group will be completely dropped. This omission of variable is consistent with the econometric specification of Poisson FE method giving robust results. However, the estimation of pooled Poisson regression will be presented in the appendix as a robustness check. In the following sub-section, the results of the regressions will be discussed.

### 5.1. Estimation Results

Table 7- FE Poisson Regression Results (IRR)

	M1	M2	M3	M4	M5
TBT STC <sub>t</sub>	1.182** (0.088)	1.183** (0.089)	1.182** (0.089)	1.152* (0.087)	1.142* (0.085)
TBT STC <sub>t-1</sub>	0.491*** (0.045)	0.490*** (0.045)	0.492*** (0.045)	0.485*** (0.044)	0.485*** (0.044)
SM <sub>t</sub>		14.21* (22.3)	11.18 (18.6)	11.08 (18.1)	14.76 (24.5)
SM <sub>t-1</sub>		0.679 (0.96)	0.598 (0.87)	0.633 (0.92)	0.779 (1.14)
T <sub>t</sub>			1.025 (0.017)	1.039** (0.019)	1.039** (0.019)
T <sub>t-1</sub>			0.985*** (0.0058)	0.990 (0.0071)	0.990 (0.0072)
Y <sub>it</sub>				39.69*** (19.4)	34.83*** (17.3)
Y <sub>jt</sub>					0.468** (0.17)
<i>N</i>	31413	31413	31413	31413	31413
<i>AIC</i>	6673.4	6684.7	6666.1	6629.3	6631.5
<i>BIC</i>	6690.1	6768.3	6716.2	6721.2	6756.8
<i>Time Effects</i>	Yes	Yes	Yes	Yes	Yes

Exponentiated coefficients; Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7 represents the FE Poisson regression results of the model. Incidence Rate Ratio (IRR) is presented as the estimated coefficients of the variables. Thus, a coefficient bigger than one indicates a positive impact of the given variable on the dependent variable and, and the one smaller than one a negative impact. As it is observed within all specifications, there is a statistically significant positive relationship between disputes and current TBT STCs. From the second column to the left, we can state that given other variables constant in the model, a new TBT STC raised by a partner country on a TBT imposed by a reporter country on a specific product is expected to increase the probability of a DS case to be requested by the partner on the given product by about 1.142 times. However, TBT STCs raised in the previous year (TBT STC<sub>t-1</sub>) is statistically significant but decreasing the probability of occurrence of such DS case, holding the current TBT STCs and other variables constant.

Although the current TBT STCs have strong positive influence on DS requests to the WTO, previous TBT STCs act in the opposite direction.

The possible explanation of those results can be as follows. Usually, TBTs regulations have long lasting nature. The significant effects of regulations are generally observed instantly after their imposition. After some period of time, producers can adjust characteristics of their products to new regulations and continue their participation in the foreign market. This means that a TBT STC that is raised in previous years does not cause the same problems that it had provoked in the beginning. As Swann (2010) demonstrated in his literature review, the implementation of standards, increasing market transparency, can have a positive impact on trade flows in the long run. Therefore, it is very likely that TBT STC existing after some period of time, are decreasing the “demand” for consultations, as the producers and countries facing those TBTs have already complied with those standards. Overall, we can state that our analysis confirms the hypothesis that the imposition of a new TBT STCs can act as early warning for future DS cases.

Share of imports is statistically significant at 10 percent level but only in one specification including only TBT STC. This suggests that a major exporter is not evidently more eager to request for consultation within DSM than a smaller exporter is. Hence, increasing the share of import from a trade partner will not increase – in a statistically significant way - the probability of filing a case by a trade partner.

As discussed earlier, there is possible substitutability between tariffs and NTMs. In our specifications ((3) to (5)), we control for both of them. Results show the statistically significantly positive relationship between current tariffs and the occurrence of a TBT DS case. Since tariffs contained in the schedules of concessions are bound for WTO members, one can argue that a one-unit drop in the tariff on a product, would decrease the probability of occurrence of a DS case citing TBT agreement on the given product by a factor of about  $0.96^{28}$ , holding other variables constant. Probably, it means decreasing tariffs are treated as a signal of trade liberalization, while countries request for consultation only when they believe that TBT agreement is violated by imposition of an unnecessary obstacles to trade. Thus, such positive relationship between tariffs and the requests for consultations is quite in line with economic literature.

As discussed earlier, real GDP of the reporter and partner country have the expected influence on the occurrence of DS cases. The bigger the reporter country is the higher will be the effects of its policy instruments on international trade. The statistically significant coefficient of real GDP of the reporter suggests that a one percent increase in the real GDP of that country is expected to increase the probability of that country to be respondent for a DS case by about 34 times. On the other hand, the statistically significant coefficient of the partner’s real GDP suggests that the smaller the trade partner is the higher will be the probability of being a complainant by about 2.13 times. A smaller country is more vulnerable than a large country against prohibitive trade policies of a given country.

## 6. Concluding remarks

In this paper, we presented a summary of STC database on TBT. Newly created STC database is a useful tool increasing information on TBT measures and reducing the asymmetry of information. It was mentioned that the STC data on TBT has several potential weaknesses, resulting from duplications of observations. In order to improve the data for the analytical analysis, we suggest the deletion of multiple observations within one STC item.

The descriptive analysis of linkages between DS cases and STC database on TBT measures was based on matching information from both sources. Out of 45 requests for consultation in

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<sup>28</sup>  $\frac{1}{1.04}$

DSM for violation of TBT agreement, 27 cases have been found in the STC data as well; among which four cases have been found in the SPS STC database. There are 19 cases in the TBT STC database that are related to 23 disputes. The probable reasons of dissimilarity between trends of STCs and disputes on TBT initiated have been discussed in the paper. Gaps between the dates of raised concerns on TBT and requested cases in the DSM, multiple cases of DS relating to one STC, multiple items of STC relating to one DS case, are probably the main reasons of such dissimilarities.

According to the citations in the DS cases, Panel and Appellate Body's reports, article 2 of the TBT agreement was the most frequently violated article in all cases. In 16 cases, Article 2.1 of TBT agreement have been cited and it was the main issue of some Appellate Body's reports. In fact, discriminative aspects of the TBTs imposed by some governments have led to complaints by other members leading to requests for consultations. Even though all WTO members demand transparency of trade policies, some TBTs are still having discriminatory effects in international trade. The European Communities and the United States of America are maintaining most of STCs on TBT and they are respondent for most of the DS cases. In 45 cases of disputes citing TBT agreement, DS body has proved in its findings that EU members have violated TBT agreement once and violated other WTO agreements for 8 times. We also showed that the USA has violated TBT agreement for four times and other WTO agreements twice. While China is the second country maintaining TBT STCs, there have been no consultations requested against this country under DSM regime. Nevertheless, EU as the first, and the US as the third country imposing TBT STCs, have been responding to the largest numbers of DS cases citing TBT agreement. It is worth mentioning that countries raising STCs are mostly quite reluctant to initiate cases in DSM in order to maintain frictionless multilateral trade with their partners. In other words, WTO members usually prefer using bilateral and multilateral negotiations under TBT Committee rather than starting the costly disputes rapidly.

Thus, basing on a simple descriptive analysis, we find no genuine evidence that STCs provide a good foresight for future disputes on TBTs. However, the econometric analysis allows us to draw more precise conclusions. We provided an econometric evidence linking the current raise of STCs on TBT and the request for consultations citing TBT agreement. In other words, increase of the TBT STCs at present increases probability of raising a request for consultations citing TBT Agreement within the DSM. Nevertheless, past STC TBT do decrease this probability, since producers had already time to adapt their products to new TBT regulations.

Thus, we believe that trade economists shall analyze both sources, i.e. STC and disputes in order to find out whether the TBT measures are creating "unnecessary" barriers to trade. Moreover, increase in the number of TBT STCs should be interpreted as a warning signal for new costly and long-lasting disputes within the WTO system. Those TBT measures can create significant trade distortions if they discriminate between domestic and foreign suppliers, and thus violate the principle of non-discrimination.

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## Appendix

**Table 8- Countries (groups of countries) respondents of STCs raised by other members**

No	Member Maintaining	No. Obs.	No. STCs	No	Member Maintaining	No. Obs.	No. STCs
1	European Union	3138	64	23	Chile	174	2
2	China	1366	39	24	Viet Nam	68	2
3	United States	1083	35	25	Hong Kong, China	13	2
4	Korea, Republic of	698	25	26	Moldova	8	2
5	India	642	18	27	Norway	2	2
6	Brazil	635	18	28	Saudi Arabia, Bahrain, Kuwait	465	1
7	Japan	198	11	29	Kuwait	247	1
8	Indonesia	613	10	30	Tunisia	161	1
9	Mexico	509	9	31	Ukraine	161	1
10	Canada	177	9	32	Venezuela	44	1
11	Colombia	78	8	33	Qatar	20	1
12	Argentina	177	7	34	Kenya	17	1
13	Thailand	29	6	35	Croatia	11	1
14	Taipei, Chinese	399	5	36	Philippines	10	1
15	South Africa	341	4	37	Switzerland	6	1
16	Egypt	249	4	38	Australia	2	1
17	Turkey	23	4	39	Uruguay	2	1
18	Israel	12	4	40	Bahrain	1	1
19	Malaysia	65	3	41	Jordan	1	1
20	Peru	62	3	42	Saudi Arabia	1	1
21	Ecuador	11	3	43	United Arab Emirates	1	1
22	New Zealand	506	2				

Source: Own calculations from STC database

**Table 9- Products at 2-digit HS 2 level in the focus of STCs**

<b>Rank</b>	<b>Codes</b>	<b>N. STC</b>	<b>N. Obs.</b>	<b>Rank</b>	<b>Codes</b>	<b>N. STC</b>	<b>N. Obs.</b>	<b>Rank</b>	<b>Codes</b>	<b>N. STC</b>	<b>N. Obs.</b>
1	22	57	543	28	29	12	511	55	50	6	42
2	85	41	428	29	61	12	329	56	24	6	15
3	2	40	480	30	95	12	68	57	34	5	72
4	84	40	291	31	62	11	337	58	39	5	11
5	4	38	388	32	63	11	164	59	25	5	10
6	3	36	290	33	72	11	97	60	37	4	71
7	21	34	224	34	30	11	93	61	70	4	30
8	19	34	191	35	64	10	111	62	68	4	20
9	16	34	188	36	69	10	47	63	96	4	5
10	15	33	770	37	55	8	189	64	41	3	40
11	8	32	523	38	58	8	91	65	71	3	23
12	12	32	511	39	60	8	83	66	74	3	13
13	7	31	519	40	65	8	45	67	48	3	11
14	9	31	363	41	43	8	35	68	86	3	10
15	20	31	326	42	32	7	167	69	6	3	8
16	11	30	326	43	51	7	88	70	83	3	4
17	10	30	291	44	54	7	78	71	91	2	22
18	18	30	217	45	56	7	74	72	44	2	18
19	33	29	279	46	52	7	73	73	75	2	16
20	17	29	144	47	53	7	73	74	5	2	12
21	87	26	223	48	31	7	67	75	82	2	11
22	90	26	119	49	36	7	65	76	27	2	5
23	94	18	32	50	42	7	42	77	76	2	2
24	1	14	114	51	73	7	36	78	92	1	3
25	40	14	100	52	57	7	35	79	26	1	2
26	38	13	295	53	35	6	73	80	88	1	2
27	28	12	578	54	59	6	66	81	23	1	1
								82	Undefined	42	57

Source: Own calculations from STC database

The last one (rank 82) is for all those STCs that do not have defined product in the database.





FACULTY OF ECONOMIC SCIENCES  
UNIVERSITY OF WARSAW  
44/50 DŁUGA ST.  
00-241 WARSAW  
[WWW.WNE.UW.EDU.PL](http://WWW.WNE.UW.EDU.PL)