COMPUTING NON-TARIFF MEASURES INDICATORS: ANALYSIS WITH UNCTAD TRAINS DATA

Denise Penello Rial

Economic Affairs Officer, Division on International Trade and Commodities, UNCTAD

denise.penello.rial@unctad.org

Abstract

Data on Non-Tariff Measures (NTM) contribute to transparency and can be used for statistics suitable for economic analysis. This study provides a description of the data cleaning process applied to the UNCTAD TRAINS NTM Data for Research and describes the standard methodology to compute indicators. Analysts can use the indicators for descriptive statistics or as variables in economic models. The objective of this document is to describe in detail the nuances in the treatment of the data in practical terms and share the procedures to synthesize the data into indicators that provide information that is useful to build knowledge and derive conclusions. The indicators resulting from the application of the described methodology are available for download from the UNCTAD TRAINS (trains.unctad.org) web site and the NTM hub unctad.org/ntm.

Key words: non-tariff measures, database, statistics

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1. Introduction

Non-Tariff Measures (NTMs) data in the Global TRAINS NTM database stems from legal national requirements that can directly or indirectly affect international trade in goods. The regulatory information is linked to the specific product to which the legal requirement is applied. The TRAINS NTM database contains comprehensive data for more than 100 countries.[1] The data covers all requirements that can potentially affect international trade for a specific product in a specific country and for a specific trading partner in one point in time. It contributes to transparency and allows statistical treatment suitable for economic analysis.

Policy makers are increasingly acknowledging the benefits of centralized information points, often called trade portals. Such portals are useful, not only for traders, but also for those responsible for developing and/or evaluating regulations such as technical requirements, which are increasingly important for trade. Technical requirements are based on non-trade related policy objectives, designed and implemented by technical departments within governments; very often without coordinating with other departments in charge of trade or economy. Although centralized registers of regulations in trade portals are very useful and enhance transparency, the TRAINS NTM database goes several steps further: it allows to access systematized information by product, measure type, countries imposing and affected and several other variables. It is therefore a valuable tool for coordinating offices and offices dealing with export promotion or small and medium size enterprises (SME) support as well as for researchers.

The TRAINS NTM database can be used to produce descriptive statistics such as incidence measures. Three basic indicators: frequency index, coverage ratio, and prevalence score, are particularly indicated to describe the use of NTMs as policy instrument in simple statistics. They provide information on how often a country uses NTMs, the most common NTM types, and the nature of the most regulated sectors.

Another feature of the UNCTAD TRAINS NTM database is the provision of detailed information about specific products or measures. Datasets are available for bulk download but should be processed or cleaned to offer more consistency for statistical analysis.

This paper provides a description of the data cleaning process and a standard methodology to build incidence measures (statistical indicators) that can be used as descriptive statistics or as variables in economic models. The indicators described here may be used to test hypothesis in economic models and thus suggest possible impact on trade, but also in other development or welfare analysis.

This publication follows previous work by UNCTAD in the area of NTMs (UNCTAD, 2012, 2013, 2015, 2016, 2017, 2018 and also World Bank, 2012) and replaces Section 5.3 of the TRAINS User Guide (UNCTAD, 2017).

The process of original data collection, data description, and available information can be found in UNCTAD (2017). The same NTMs data is published under different formats[2], through:

- World Integrated Trade Solution (WITS)
- Web Application Trade Analysis Information System (TRAINS)
- STATA file for bulk download
- Global Trade Helpdesk

The paper focuses on the STATA file for bulk download (also called Researchers' file). It aims to describe in detail the nuances in the treatment of the data and share the procedures to synthesize data into indicators that provide information useful to build knowledge and derive conclusions. It describes the cleaning process of raw data and the assumptions taken for building the NTM incidence measures that are presented in the

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[1] This counts the European Union countries individually.
[2] See UNCTAD (2017), Section 5, for more details.

downloadable STATA file available in the UNCTAD TRAINS (trains.unctad.org) website. The same approach is used for the indicators on NTMs in WITS.

Statistical indicators (incidence measures) are computed based on a 'clean' dataset. These are also published, using the preferred options described in this report. This publication covers a wide range of issues of interest for NTM data users. Some common disaggregation is chosen (countries, sectors, chapters), others can be calculated using the Researchers' file and the approach outlined in this report.

When referring about cleaning process, we do not imply that the full / raw TRAINS data is not clean and quality controlled, but rather that it contains information (e.g. information at the tariff line level or correct measures duplications) hindering cross-country comparisons. Furthermore, it must be recalled that the inclusion in the database of NTMs derived from legal national requirements, does not imply a judgement on the legitimacy or appropriateness of these requirements. NTMs are recorded in a neutral way with the purpose of fostering transparency of the policy tools that may affect international trade.

2. Data on NTMs

The collected NTM data is published through several dissemination tools, notably UNCTAD TRAINS database accessible through trains.unctad.org and WITS (wits.worldbank.org). The same data is also accessible in the ITC – UNCTAD - WTO Global Trade Helpdesk, which is more catered to private sector users.

The UNCTAD TRAINS web site allows for browsing of the available NTM data. Within the page, there is a file in STATA format available for bulk download which presents the processed data at HS6 digit level for the latest available year in each country. Those data are cleaned following the process described in this document.

The classification, the data collection approach, as well as strengths and limitations of the data are described in UNCTAD (2017). The variables described in that document are the ones present in the database, aggregated at the HS6 digit level, but containing all original data, before applying the cleaning process described here.

The data made available for statistical use is in STATA format. The unit of analysis is based on the combination of:

    i.   reporter country enforcing the NTM,

    ii.   partner country,

    iii.   product at HS6 level affected, and

    iv.   NTM code at the maximum level of disaggregation (4 digits).

Each of this quadruple is listed only once in the database. There is one variable that indicates how many identical combinations were found in the original data. The name of this variable is 'nbr'. This variable reflects those cases where two (or more) different regulations with the same NTM classification code apply at the same time to a product.

This study focuses on cross section data. Specifically, the latest wave available for countries in which data were collected. It is a snapshot of NTM regulation in each of these countries at the time of the data collection.

2.1 CLEANING OF RAW DATA

The NTM data is cleaned to compute the NTM indicators so that the result is more meaningful for economic analysis. The analysis using 'clean' NTM data is suitable for showing a first assessment of the country's regulatory practice, through statistical incidence or prevalence of NTMs. Those analysts searching for specific products or policy tools should look into the raw TRAINS NTM data, especially if the interest is focused on the details of the requirements enacted by the laws.

The STATA file is used for general statistical analysis. It is thus constructed to serve that purpose. The cleaning of the data is the first step.

Horizontal measures

The database that is referred to in this document is cleaned of 'horizontal measures' and 'partial coverage'. Therefore, Indices in this study are computed using the occurrence of each quadruple described above, and which does not involve any horizontal measure, nor measures that apply to the products only partially.

Horizontal measures are those that apply to all products across the board, e.g. an import license necessary for importing any kind of product, or the need to register to be an importer (Box 1). To allow a more meaningful analysis, those measures that are 'horizontal', are not considered (specifically, those single measures affecting at least 95% of the products in a country[3]).

If these data were not excluded, Frequency Index and Coverage Ratio would be equal to 1, even if only very few other NTMs were implemented in the country. It would therefore be impossible to see the regulatory pattern of the country beyond that (usually just one) horizontal NTM, which is usually more of an administrative nature.[4]

Horizontal measures may be applied to all countries in the World (these are called unilateral horizontal measures), or to some countries only, in which case they are called bilateral horizontal measures.

Box 1. Horizontal measures in the original data from 2016

There are 53 countries in the database that use horizontal measures. They put in place 255 independent requirements. This includes NTMs regardless if they apply with partial or full coverage, or if they are bilateral or unilateral.

Half of the countries use 1, 2 or 3 horizontal measures, and only 7 countries use 10 measures or more each.

Almost 4 out of 5 horizontal measures are unilateral, i.e. applied to all trading partners. Furthermore, some of the bilateral NTM are applied to so many countries that they could also be considered unilateral. This is the case for 7 countries applying 15 measures to more than 200 countries each. 4 other countries apply bilateral measures to 10 to 40 countries each, and 13 more apply 34 bilateral measures that affect only 1 or 2 countries each.

One of the most common types of horizontal NTMs is export measures. In general, NTMs in chapters E, F and G are more common in horizontal measures that in the rest of the data. Financial NTMs from chapter F, are most common among import unilateral NTMs, followed by those in Chapter B. Those of chapter E are more often used when considering bilateral import NTMs. Technical Barriers to Trade (TBT) measures are normally not horizontal, but when it is the case, they are always unilateral. Only five countries have horizontal Sanitary and Phytosanitary (SPS) measures.

Partial coverage

The STATA file available for download also excludes all NTMs with partial coverage.

Partial coverage may be of two types. The first is the 'tariff line' partial coverage. It is used when a regulation affects a very specific type of product that would go beyond the national tariff line classification or cannot be defined by any precise product code, for example used cars, or chemicals that are imported to be used in a particular industry; there are no product codes that can describe this. A second type of partial coverage refers

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[3] Horizontal measures are flagged at the level of disaggregation that is reported in the raw data, i.e. tariff line or HS6. A specific requirement within a regulation is flagged when it affects at least 95% of the products that exist at the same level of disaggregation of the reported data and for the same HS year nomenclature.

[4] Horizontal measures are still accessible to the user through the web application TRAINS, which is a tool designed especially for browsing and looking for specific punctual information, but less suitable for statistical bulk processing.

to measures that apply only on some (not all) tariff lines within an HS6 product, e.g. an NTM that affects the product with the tariff line 02.07.25.20, but not 02.07.25.00, nor 02.07.25.40, within the same 02.07.25.

For those countries where data is collected only at HS6 level, and not at Tariff Line level, it is impossible to differentiate between the two types of partial coverage.[5] For this reason, all cases of partial coverage are excluded to compute the statistical indicators.[6]

Figure 1. Illustrative example of 'partial coverage'

Panel a. Example for countries with data collected at tariff line level

	Codes available at TL level	NTM with Partial Coverage at the TL	NTM with Full Coverage	Partial Coverage at the HS6
010203	010203.01	X	X	
	010203.02	X	X	
	010203.03		X	
	010203.04		X	
020304	020304.01		X	Two out of three product codes
	020304.02		X	
	020304.03			
030405	030405.01		X	
	030405.02		X	
040506	040506.01	X		
	040506.02			

Panel b. Same example, but for countries with data collected at HS6 level

	No information available at TL level	NTM with Partial Coverage at the TL	NTM with Full Coverage	
010203		X	X	
020304		X		It is impossible to know which origin is this Partial coverage indication
030405			X	
040506		X		

Note. For a single reporter-partner

Figures 1 and 2 show 4 different products at the HS6 digit level (010203, 020304, 030405, 040506, these are not real product codes). Each of them has two or more 8 digits code products. Panel a) represents a country collected at Tariff Line (TL) level, and so the 8 digits product codes are listed in the database. Panel b) does not show the Tariff Line product codes as it was collected at HS6 level only. The third and fourth columns in each panel indicate the presence of NTMs for the products with an X. The column 'Partial Coverage' indicates when the products are affected by NTMs with Partial Coverage. The column 'Full Coverage' is used when the NTM affect the products fully. These indications are based on the description of the legal text in the corresponding regulation.[7]

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[5] This is the reason why partial coverage was dropped for all countries, even when it would be desirable to keep those data where more than 50% of any HS6 code is affected by an NTM ('coverage' partial coverage). It would be possible to do so for countries where data was collected at Tariff Line level, but not for the ones where data was collected at HS6 level. Hence, all partial coverage data for all countries was dropped to keep consistency across countries.

[6] In some cases, one regulation affects 'fully' some HS6 level products, and 'partially' others. In these cases, data is not corrected. The same rule applies for these data, and those products affected 'fully' will be preserved, while those affected only 'partially' would be dropped from the database.

In some other few cases, one regulation affects 'fully' some tariff line products within any HS6, and 'partially' others (within the same HS6). In these cases, the NTM in question will be set to affect 'fully' all tariff line products within that HS6 product code, and data is preserved.

[7] For methodology of data collection please see UNCTAD 2017

In Figure 1, the third column presents the data that show partial coverage at the Tariff Line level. The first product in the list, HS6 010203, has measures both as partial and full coverage. These are stemming from different regulations but are enforced simultaneously on the same product. Each of the four 8-digits product codes within this HS6 is affected fully by an NTM (010203-01, 010203-02, 010203-03, 010203-04), and only 2 of those are also affected by measures with partial coverage (010203-01, 010203-02).

Panel b shows the same data (same NTM as examples) but for those countries that have been collected at HS6 level only, i.e. with no information at Tariff Line level. For product 020304, there is a mark for partial coverage, but we are not able to know that it comes from an NTM that affects with Full Coverage only some of the Tariff Lines within this HS6. In this case, Partial Coverage is indicated with no further information.

Figure 2. Illustrative example of data cleaned-out after all 'partial coverage' is dropped

Panel a. Data collected at tariff line level					Panel b. Data collected at HS6 level				
	Codes available at TL level	NTM with Partial Coverage at the TL are removed	Only NTM with Full Coverage remain	Stays in the dataset after cleaning		No information available at TL level	NTM with Partial Coverage at the TL are removed	Only NTM with Full Coverage remain	Stays in the dataset after cleaning
010203	010203.01		X	Yes	010203			X	Yes
	010203.02		X						
	010203.03		X						
	010203.04		X						
020304	020304.01		X	No	020304				No
	020304.02		X						
	020304.03								
030405	030405.01		X	Yes	030405			X	Yes
	030405.02		X						
040506	040506.01			No	040506				No
	040506.02								

Figure 2 shows how the data is cleaned. The Yes sign marks those products that still bear NTMs after the statistical cleaning, while the No marks point to those products whose NTMs are dropped. All those NTMs affecting partially the products are not considered for the calculation of the indicators, and so information in column 'Partial Coverage' is dropped entirely. It is shown in Figure 2 with an empty column. Products 010203 and 030405 are still affected by an NTM at full coverage.

The NTM for the second product, HS6 020304, is dropped. Panel a) in Figure 1 shows it only has NTMs on