Chapter 2

Non-Tariff Measures in International Trade: Classification, Data and Recent World Trends

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CHAPTER 2

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1. Background

Regulations are increasingly shaping trade. Standards often determine market access, and the requirements imposed on the products and/or the processes for production affect trade costs in many cases. By affecting market access and costs, non-tariff measures (NTMs) could induce trade preclusion or trade diversion (Hoekman and Nicita, 2017; Essaji, 2008; UNCTAD, 2017; Staiger, 2015; Xiong and Beghin, 2014). The simplistic assumption that NTMs are the new policy instruments for protectionism, as were tariffs in the past, has led to the view that all NTMs should be removed. A more careful consideration, however, suggests that the safety, sanitary, and environmental objectives pursued by countries need enforceable regulations, and that these should undoubtedly affect imported goods as well domestic ones. These regulations are also NTMs, so policy towards NTMs should reflect the trade-off between legitimate regulatory objectives and distortions of international trade.

In recent years, most countries have significantly reduced their tariff levels for most products, and they have also promoted trade facilitation, signed trade agreements, and used aid for trade to improve trading capacity (Cadot, Malouche and Saez, 2012; Lamy, 2014; UNCTAD, 2013; WTO, 2012). This policy focus on increasing international trade has naturally drawn attention to other policies that may hinder or further increase it, and NTMs fall firmly within this class. That is, NTMs, which affect the ability of countries to take advantage of improvements in market access, either positively or negatively, have moved centre stage; and nowhere more so than in the Association of Southeast Asian Nations (ASEAN).

NTMs figure prominently in the economic and political debate that surrounds countries' export and import business: Are certain NTMs to be eliminated? If so, which ones? Are some NTM necessary for safety and do some stimulate trade? How to tell? Is there a way that countries can avoid protectionism while attaining their non-trade objectives in other areas, such as public health? In which ways may countries negotiate in this area? To answer these and other related questions, more research and investigation is necessary.

Sound economic analysis is based on data analysis. In the past, trade negotiations were influenced heavily by the quantitative analysis of tariffs. When researchers attempt to use the same tools in the area of NTM, however, they face at least two additional problems.

First, governments have, at best, only incomplete information on the NTMs in force in their trading partners and sometimes even in their own country. Second, there is the difficulty of quantifying the effects of NTMs. This can be challenging even for simple price interventions such as tariffs, but is much more so for regulatory measures that might affect market structure and/or deliver important benefits in their own right, such as sanitary or technical requirements.

Policymakers and businesses would welcome detailed information on the trade control measures taken by their partners and, of course, quantitative analysis would shed light on the costs and/or benefits of NTMs for traders, big companies or small and medium-sized enterprises (SMEs), and economies at large.[1] A necessary first step to providing such information is that there is complete transparency about the NTMs that are actually implemented. To address this need, the United Nations Conference on Trade and Development (UNCTAD) has started to create a global database on NTMs that would be useful for economic analysis and for consultation by traders. The task of data collection is vast, but even before it could start a conceptual agreement on what should be considered an NTM was needed.

UNCTAD has long experience of work in this area, going back at least to the 1980s with a collection of data on non-tariff barriers in developed countries[2] and a joint UNCTAD–World Bank research effort published in Nogues, Olechowski and Winters (1986).[3] During the 1990s data collection continued and evolved. At that time, 'core' measures were not the technical measures, such as Sanitary and Phytosanitary (SPS) or Technical regulations (TBT), but quantity and price restrictions, especially Quotas and voluntary export restrictions (VERs).

More recently, attention has shifted towards SPS and TBT, since this is perceived as the most constraining aspect of regulation in present times. This created the need to revamp the method and underlying classification of NTMs. In 2006, UNCTAD's Secretary-General established the Group of Eminent Persons on Non-Tariff Barriers (GNTB), composed of leading economists, and a Multi-agency Support Team (MAST) group composed of several international agencies[4] provided extensive support to the GNTB (UNCTAD, 2009).

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[1] An illustration of the contribution that data collection and analysis can make to negotiations is the work by the Organisation for Economic Co-operation and Development (OECD) in the 1980s to identify and quantify restrictions on agricultural trade, which was a necessary precursor to the first effective multilateral negotiation of such trade barriers in the Uruguay Round. See, for example, Cahill and Legg (1990) on the estimation of agricultural assistance using producer and consumer subsidy equivalents.

[2] A note from General Agreement on Tariffs and Trade (GATT), of 20 November 1989, MTN.GNG/NG2/W/47, 'Negotiating Group on Non-Tariff Measures', during the Uruguay Round Negotiations, mentions the Trade Control Measures Information System (TCMIS), which includes non-tariff measures applied at the border in over 100 countries. It was said to provide important inputs for the periodic review of world trading conditions and, at the same time, that UNCTAD continued to refine its methodology. See 'Introductory note on methodology employed and the problem of definition', UNCTAD/TD/B/AC.42.5, Geneva, March 1988. Other references to UNCTAD's early work are: a) study prepared by Professor O. Havrylyshyn in 1988, b) Erzan, Kuwahara, Marchese and Vossenaar (1989), UNCTAD Discussion Paper No. 21; c) Deardorff and Stern (1985) UNCTAD/ST/MD/28; d) The Inventory of Non-tariff Barriers, a report by the UNCTAD Secretariat, TD/B/940, in 1983.

[3] Non-tariff barriers (NTBs) are a subset of NTMs, implying an unnecessary negative impact on trade.

[4] Namely Food and Agriculture Organization (FAO), International monetary Fund (IMF), International Trade Centre (ITC), Organization of Economic Co-operation and Development (OECD), United Nations Conference on Trade and Development (UNCTAD), United Nations Industrial Development Organization (UNIDO), the World Bank, and World Trade Organization (WTO).

As an outcome of the discussions in these groups, a definition for NTMs was provided, as well as the related taxonomy that allows the detailed classification and development of a database of NTMs.

During the last decade, UNCTAD has been leading the global effort in NTMs. Together with its partners and regional organisations from all over the world, UNCTAD classifies and collects all NTMs into a new dataset, called TRAIN-i-Tip. As of today, this new NTMs dataset covers 109 countries and 90 percent of world trade, with nearly 80 percent of all traded goods affected by non-tariff measures.

A vivid example of this global effort is the ASEAN NTM data collection and analysis project between UNCTAD and the Economic Research Institute for ASEAN and East Asia (ERIA). The project is an ambitious yet fruitful team effort initiated in 2014 aiming to conduct thorough studies of the trade-related legislation of 10 ASEAN Member States and subsequently extend it to Regional Comprehensive Economic Partnership (RCEP) + 6 countries[5], to collect the NTM data and to classify the identified NTMs based on the aforementioned methodology. The rather unique nature of the project was predetermined by its scope, the diversity of the legal systems under consideration, accessibility of legal texts, as well as by tight deadlines targeted by ERIA and UNCTAD.

2. The Classification of Measures, a Taxonomy of Non-Tariff Measures

The work of the GNTB and the MAST resulted in the publication of the International Classification of NTM in 2012.[6] It should be stressed that it constitutes more than a mere tool for collecting data. It conciliates different approaches to NTMs into a single taxonomy. It provides a common language for all researchers and policymakers that need to engage in dialogue about these matters. More importantly, it allows for collecting data globally in a consistent and coherent way.

Before there was this International Classification of NTM, different countries, and also even some agencies involved in the MAST group, had their own approaches and lists or classifications of measures. Data collected in this way, through dissimilar approaches and classifications, could never be comparable. Thus, none of those, including UNCTAD's would be useful for a global analysis and/or negotiations. As a consequence of unifying efforts, not only is there consensus among different experts, but coherence in the approach and, more importantly, data collection efforts can be scaled to encompass more countries under a single database.

[5] The Regional Comprehensive Economic Partnership (RCEP) is a proposed free trade agreement (FTA) between the 10 member states of the Association of Southeast Asian Nations (ASEAN) (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam) and the six states with which ASEAN has existing free trade agreements (Australia, China, India, Japan, Republic of Korea and New Zealand).
[6] UNCTAD/DITC/TAB/2012/2/Rev.1

This NTMs classification is now widely accepted by international organisations, think tanks, and researchers as a global standard to identify and classify NTMs. The classification and the data accompanying it, are presented as a global public good that is useful for analysis. It can be used to construct aggregate indices, as well as to support case studies.[7] Data collected, published, and shared contribute to the transparency of regulations implemented around the world.

2.1. Principles used

Economic knowledge produced through analysis is based on factual data. Therefore, it is essential that data is considered neutral, so that unbiased analysis can be based on neutral facts. The concept of NTMs in the database that UNCTAD is presenting is neutral; the inclusion of a measure does not imply either a negative or a positive impact on trade or welfare, nor the illegitimacy or illegality of the measure. There is, simply, no a priori judgement.

Data collection records public information of regulations that are in force with the objective of mapping all policies that affect traded goods, including those that have non-trade objectives. Another feature of this database is that data collected originates exclusively in 'Official Sources', i.e. is registered directly from legal official texts from a country, and is publicly available as enforced regulation.

All the requirements for undertaking a specific trade are included, not only those that are assumed to be a problem or imply a high cost. This is for two reasons. The first is that selection would in itself require some type of judgement and analysis prior to including the measures in the database's existence, which goes against the basic idea that data is to be used to test hypotheses. The second is that, even if a judgement was desirable, there could not be a single undisputed method to spot those measures that comply with the condition of being a barrier or obstacle to trade. This would depend on the possible approaches, but may also vary across countries, companies and time.

It is worth noting that the same data collection and classification methodology is used in all the countries where it is collected. Both national and international experts in charge of this exercise are certified by UNCTAD and have successfully completed, sometimes both in person and online, UNCTAD NTMs training courses. Ultimately, the data collection is performed by following the UNCTAD Guidelines to Collect Data on Official NTMs.[8]

2.2. Recording NTMs is not the same as quantifying them

While neutrality is sought for the reasons just noted, it does imply that the database cannot itself be used directly to identify trade distortions. Neutrality is understood in the following

[7] The fact that the classification has been agreed does not mean that it should not be periodically revised, to consider the lessons learnt from data collection, as well as changes and new challenges in the regulatory aspects of trade. The MAST Group continues to gather regularly to discuss to ensure that the Classification evolves and is adapted to the reality of international trade to cover all relevant measures.

[8] For more information: http://unctad.org/en/PublicationsLibrary/ditctab2014d4_en.pdf

context. First, measures registered in the database do not immediately provide information on their price or quantity impacts on trade or welfare. These require further analysis and information on the markets and trade flows. Second, the NTM database records what the regulations state 'on paper', and does not describe whether those requirements are implemented, or enforced.

The existence of an NTM on a specific product in a given country does not necessarily mean that the country has a more restrictive trade regime than another country which has no such NTM. That would depend on the nature, substance and application of the measure. Some NTMs might even have a positive impact on trade, although many are thought to have important restrictive and/or distortionary effects on international trade regardless of whether they are applied with protectionist intent or to address legitimate objectives. The most common NTMs are technical requirements in the areas of SPS or TBT and are intended to protect health or safety, or provide environmental protection. All NTMs are collected, included and published, irrespective of their effect.[9]

Quantification may also be complicated by the interactions between the different measures that may be applied to the same commodity. NTMs include technical measures, such as sanitary or environmental protection measures, as well instruments of commercial policy, e.g. quotas, price control, exports restrictions, or contingent trade protective measures, and also other behind-the-border measures, such as competition, trade-related investment measures, government procurement, or distribution restrictions. The Classification presents this information in different chapters or categories of policy measures so they can be separated for special analysis if required.

Thus, any study of a specific market or commodity must potentially draw on several chapters and quite complex economic analysis and data on actual transactions are often required to determine the effects of particular NTMs or their combination. As a simple example, the only effect of a tariff on a product that faces a binding quantitative import constraint is to redistribute revenue between market participants and the government. If the quota does not bind, on the other hand, the same tariff has a material effect on prices and the quantities traded.

2.3. Structure of the classification

The International Classification of NTMs offers comprehensive coverage of all NTMs and distinguishes at the most detailed level 177 types of measures. It is a taxonomy of all those policies and regulations considered relevant to today's international trade, impacting on either or both of imports and exports.

[9] Publication is in the UNCTAD TRAINS database, available through WITS software.

Box 1: Brief Description of Each Chapter in The Classification

Chapter A on SPS measures, refers to measures affecting areas such as restrictions for substances, hygienic requirements, or other measures for preventing dissemination of diseases. It also includes all conformity assessment measures related to food safety, such as certification, testing and inspection, and quarantine.

Chapter B on technical measures, refers to measures such as labelling and other measures to protect the environment. It also includes conformity assessment that relates to technical requirements such as certification, testing and inspection.

Chapter C classifies the measures related to pre-shipment inspection and other formalities performed in the exporting country prior to shipment.

Chapter D refers to contingent measures, which are measures implemented to counteract particular adverse effects of imports in the market of the importing country, including measures aimed at unfair foreign trade practices. They include antidumping, countervailing, and safeguards measures.

Chapter E includes licensing, quotas, and other quantity control measures, group measures that have the intention of limiting the quantity traded, such as quotas. It also covers those licences and import prohibitions which are not SPS or TBT related.

Chapter F includes price control measures, which are those implemented to control or affect the prices of imported goods in order to, inter alia, support the domestic price of certain products when the import prices of these goods are lower; establish the domestic price of certain products because of price fluctuation in domestic markets, or price instability in a foreign market; or to increase or preserve tax revenue. This category also includes measures, other than tariff measures, that increase the cost of imports in a similar manner (para-tariff measures).

Chapter G concerns finance measures, referring to measures restricting the payments of imports, for example when the access and cost of foreign exchange is regulated. This chapter also includes restrictions on the terms of payment.

Chapter H concerns measures affecting competition. These measures grant exclusive or special preferences or privileges to one or more limited group of economic operators. They refer mainly to monopolistic measures, such as state trading, or sole importing agencies, or compulsory use of national services or transport.

Chapter I concerns trade-related investment measures, group measures that restrict investment by requiring local content or requesting that investment should be related to export to balance imports.

Chapter J includes distribution restrictions, referring to restrictive measures related to internal distribution of imported products.

Chapter K concerns restriction on post-sales services, for example, restrictions in the provision of accessory services.

Chapter L contains measures that relate to subsidies that affect trade.

Chapter M containing government procurement restriction measures, refers to the restrictions bidders may find when trying to sell their products to a foreign Government.

Chapter N concerns restrictions related to intellectual property measures and intellectual property rights.[10]

Chapter O on rules of origin, groups the measures that restrict the origin of products, or their inputs.

Chapter P includes export measures, grouping the measures a country applies to its exports. It includes export taxes, export quotas or export prohibitions.

Source: UNCTAD, 2012.

[10] Please note that those trading activities involving imitations or copies are classified in chapter E, under E315 for prohibition of copies or imitations of patented or trademarked products.

Measures are divided into two broad categories: import measures and export measures. This is the first distinction that needs to be made. Chapters A to O reflect the requirements of the importing country on its imports. Only chapter P comprises export measures, which refer to requirements imposed by a country on its own exports. All measures imposed to condition the import of a commodity are treated as import NTMs, regardless of whether they are executed and/or verified by the exporting or the importing government; that is, the classification is based on the policy, not where it is implemented.

Import measures are further subdivided into technical measures such as sanitary, health or environmental protection measures, and non-technical measures of behind-the-border measures such as as competition, trade-related investment measures, government procurement or distribution restriction. The first group comprises three chapters (A to C): SPS, TBT, and pre-shipment inspection and other formalities. Non-technical measures are subdivided into twelve chapters (D to O). Export measures comprise only one chapter (P). Box 1 summarizes the chapters of the classification.

Each individual chapter (one digit, letters A–P) is divided into groupings using a tree/branch structure with a depth of up to three additional levels (two and three numerical digits). For example, chapter A includes nine one-digit codes, A1 through A9. Then, each of these is further differentiated by providing two-digit codes. For example, A8 includes A81 through A86, and also A89. Then, A85 is subdivided further into three-digit codes: A851, A852, A853 and A859 (see Box 2).

BOX 2: The Classification's Tree Structure

A SANITARY AND PHYTOSANITARY MEASURES
- A1 Prohibitions/restrictions of imports for SPS reasons
- A2 Tolerance limits for residues and restricted use of substances
- (…)
- A8 Conformity Assessment related to SPS
  - A81 Product registration requirement
  - A82 Testing requirement
  - A83 Certification requirement
  - A84 Inspection requirement
  - A85 Traceability requirement
    - A851 Origin of materials and parts
    - A852 Processing history
    - A853 Distribution and location of products after delivery
    - A859 Traceability requirements n.e.s.
  - A86 Quarantine requirement
  - A89 Conformity assessments related to SPS n.e.s
- A9 SPS Measures n.e.s.

B TECHNICAL BARRIERS TO TRADE
C PRE-SHIPMENT INSPECTION AND OTHER FORMALITIES
D CONTINGENT TRADE PROTECTIVE MEASURES
E NON-AUTOMATIC LICENSING, QUOTAS, PROHIBITIONS
F PRICE CONTROL MEASURES INCLUDING ADDIT. TAXES
G FINANCE MEASURES
H MEASURES AFFECTING COMPETITION
I TRADE-RELATED INVESTMENT MEASURES
(…)

Source: UNCTAD, 2012.

In the first stage of the data collection process, until 2017, measures falling within chapters J through O are not included in the collection process. So the data is available on Chapters from A to I, and Chapter P.[11]

3. Implementation

3.1. Data-collection process

The data collected are official measures currently imposed by the country and that affect their imported or exported products. They include both measures that may be checked at the customs point to allow entry or exit of the product, and those that are applied behind the border – for example, measures/requirements which condition access to the domestic market. Measures that affect only domestically produced goods are not collected. Any subjective information, such as complaints from the private sector, perceptions, and any other non-official information related to NTMs are not considered.

The steps in the data-collection process are the following:

1. Identify sources
   a. Identifying sources of information
   b. Identifying regulations (or legal texts) from each document in the sources identified
2. Register the data
   a. Identifying and classifying measures within each regulation
   b. For each measure (or requirement or requirement to be complied with), identifying and classifying affected products, affected countries, and explicitly stated objectives (if there are). Classifying affected products is done by matching the collected measure with the Harmonized System product code. This exercise is done at the most disaggregated level. For most countries/measures, the affected product is at national tariff line level, for others it is registered at 6 digits.

The first step is identifying the best source of information in each country. It may be a centralised location, where one official source compiles all legal measures, or it may be necessary to obtain it directly from the different institutions that constitute the regulatory authority over a traded product. In some of these cases, the information collected may be the only systematic one-stop point of regulations affecting a country's trade. This is a clear immediate benefit for those participating countries and, once collected, the information can then be included in a national or regional Trade Portal.

All legal documents are then obtained from these sources identified. Much effort is devoted to ensure that the data is comprehensive, in the sense that it covers all the NTMs applied on

[11] MAST members meet annually to revise the NTMs Classification. The MAST members have recently agreed to expand the taxonomy of Chapters J through O and the new NTMs Classification will soon be released with more detail taxonomy on chapters not yet collected.

imports/exports in a given country. The four principles that guide data collectors are that they need to collect all trade control requirements (measures) that:

i. Are currently applied (no matter what the date of introduction)
ii. Affect trade (i.e. imported and exported goods)
iii. Are official and mandatory (no private standards or voluntary measures)
iv. Are detailed and specific

All measures (or trade requirements) contained within each regulation (legal text) are identified and classified. The legal text is then transformed into a database format. Each measure is likely to affect certain products and countries, and there may also be objectives mentioned explicitly in the text. All of these are registered.

3.2. ASEAN–RCEP +6 NTM data collection and analysis project

The ASEAN NTM data collection and analysis effort is an ambitious project initiated by UNCTAD and the Economic and Research Institute for ASEAN and East Asia (ERIA). The project aims to conduct thorough studies of the trade-related legislation of all 10 ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam) and six major ASEAN trading partners (+6 countries: Australia, China, India, Japan, Republic of Korea and New Zealand), to collect the NTM data and to classify the identified NTMs based on the methodology just outlined. The ambition of the project is illustrated by its considerable scope, the diversity of the legal systems under consideration and the limited accessibility of legal texts in some of the cases. For some of the countries, the collected dataset constitutes the only comprehensive compilation of trade related regulations that exists, and it is now available electronically to all.

The project was initiated in 2014 and was divided in two stages. First, in 2015 and early 2016 the NTM data for the 10 ASEAN countries was collected. From 2016 until mid-2017 the NTM data was collected for the other six nations.

3.3. Data processing and dissemination in ASEAN–RCEP

The last step in the ASEAN–RCEP NTM data collection methodology relates to data processing and dissemination. Before they can be made public, the collected NTM data are revised and normalised by UNCTAD experts before it is loaded in a central SQL server database, the UNCTAD Trade Analysis Information System (TRAINS). This process ensures the coherence of submitted NTM data between all participating countries. Once it is ready, the NTM data are then disseminated from the TRAINS database to several web applications, inter alia:

1. Integrated Trade Intelligence Portal (i-Tip) and i-Tip for ASEAN. (www.i-tip.org and www.asean.i-tip.org)
2. World Integrated Trade Solution (WITS). It is accessible at wits.worldbank.org/

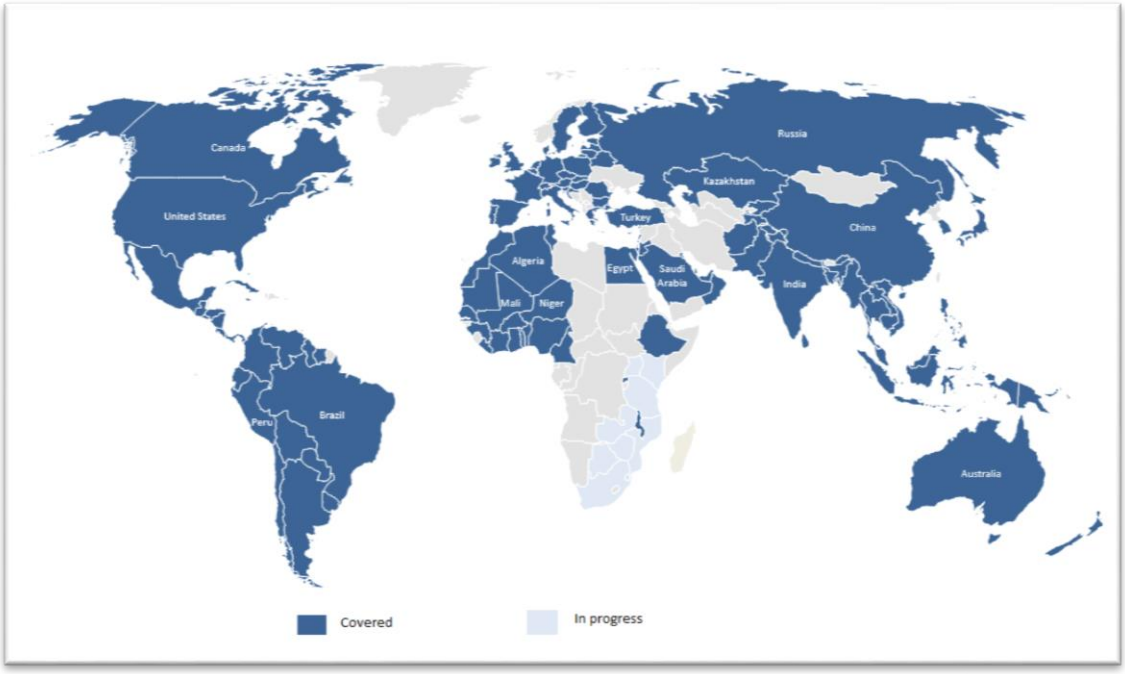
The major obstacles in achieving uniformity, coherence, and comprehensiveness of the collected data typically lay beyond the control of national data collectors. They included in various cases:

1. Limited access to implementing regulations
2. The different stages of development in countries' legal systems
3. The differences in the structure and style of legislation

3.4. Existing data

NTM data from ASEAN–RCEP +6 is now part of the global database, and filled an important gap in it. This global dataset now covers most of the world trade. The graph below shows the countries that are already available and the ones that are in the pipeline.

Figure 2.1: NTM Data Collected Shaded in Blue



Source: Authors' calculations, based on UNCTAD TRAINS database.

3.5. Initial Statistical Computations

Besides queries on specific products by a certain trader, data can also be used to build statistics, variables and/or indicators. Data are useful to create knowledge to describe a situation and/or inform responses to it. The NTM data have been designed to facilitate statistical processing. The vast array of entries in raw data can be distilled into a few meaningful indicators. Two indicators commonly used for NTMs – see Nogues, Olechowski and Winters (1986) – are the Frequency Index and Coverage Ratio. These are the incidence indicators. They are respectively: the share of products that is affected by an NTM, i.e. the number of products with one or more NTM in relation to the total number of products; and

the share of trade that is affected by at least one NTM, which is essentially the same as the frequency Index, but trade-weighted.

There are a few considerations with these initial broad indices:

a) These are measures of extent, not of depth; their parallel in terms of measuring tariffs is not the average tariff, but the proportion of products or of trade that is affected by any tariff above zero.

b) Values are strongly influenced by the level of disaggregation of the trade classification on which they are based. For example, introducing a TBT on a single 6-digit product of the HS would add 0.000189 (=1/5300) to the frequency index (it is just one of about 5300 subheadings), but 0.000833 (=1/1200) for headings at 4-digit level and 0.01 (=1/98) for chapters at 2-digit level. Of course, this potential bias can be corrected if the percentage share of coverage of a product is added up when aggregations are being used for computation of the indices, instead of a binary 1 or 0 coverage indicator. This requires that the data be available at the lower level of aggregation, but they generally are in the in the original data published by UNCTAD.

c) These incidence descriptions offer no information about the economic impact (i.e. the effects of) of NTMs, nor are they able to assess which of the entries (NTMs registered in the database) is more trade restrictive, or more development enhancing, for environment or health purposes, for example.

These two indices are useful in the first place for a very general review of countries. For example, to see if a large share of its trade is affected by any NTM, either in total or in some product group such as agriculture. It may also be used to see what share of products is affected by TBT measures, or some other NTM chapter. It is worth noting that for very common barriers, such as SPS/TBT measures, or highly regulated sectors, such as agro-food sectors, most countries record complete coverage and so the crude data often provide little distinction between regimes.

Another potentially informative calculation is the Prevalence Score or Intensity index. This takes advantage of the depth of the database by counting the number of different measures that apply to any single product, and makes it possible to see, for example, whether agricultural products face a larger number of requirements than industrial products, or vice versa. In the same line, other indices can be computed, for example the average number of measures for a country, or for any aggregation of products or sectors. It was mentioned above that these computations only describe regulatory structure, but not the economic impact. Still, these indices can be used as variables in econometric analysis in different ways.

4. How NTMs affect Trade

The indices computed from the NTM data can be used as variables in various econometric modelling exercises. One way is to include either Frequency Index or Coverage Ratio as dummy variable (scoring unity if the trade heading faces at least one NTM and zero otherwise). Depending on the analysis, it can be a broad average figure for every country, or specifically by product or product group. The same can be done for the Prevalence Score, which offers more information than a simple binary variable, and could explain better the impact of NTMs. Implicit in this is an assumption that all NTMs have the same effect on average or that different NTMs are in some sense equivalent, which could be a very restrictive assumption.

Information on NTMs can also contribute towards the computation of Ad-Valorem equivalents (AVE), which seek to move beyond the mere existence of an NTM to an assessment of the percentage costs it imposes on trade, as tariffs do. The method to compute AVEs is not covered in this note, but important references are Kee, Nicita and Olarreaga (2009), and the explanatory manual in the UNCTAD–WTO publication 'Trade Policy Analysis'.[12] This alternative has the advantage of moving towards a measure of effect of NTMs. This allows answers to several questions, such as which are the most stringent NTMs, or which are the most affected products, or which are the most affected exporters (given their export structures).

Other studies, such as Cadot and Gourdon (2015) explore estimating AVE by using the price-gap mechanism, providing estimates in a single-digit range, i.e. substantially lower than previous estimates based on Kee, Nicita, Olarreaga estimates. Price-based approaches consist of estimating the AVE of an NTM by comparing directly the price of products in the NTM's presence with that of similar products on markets without it. One major shortcoming of this estimation of NTMs AVE is the lack of availability and comparability of price data.

Still, as AVEs are inferred directly from price or indirectly from quantity comparison data in trade values, there is just one observation (at best) per product (or group products, depending on the methodology), of the overall AVE. That means that it is not possible to disentangle the different impacts of different measures applied simultaneously on the same product. Also, much of the diversity of attributes and specificities of economic impact are lost when NTM are modelled as taxes, comparable to tariffs. Moreover, the benefit to the society of better regulation is not well accounted for, e.g. prevention in the area of public health.

5. Frequency Index and Coverage Ratios on NTMs in the World

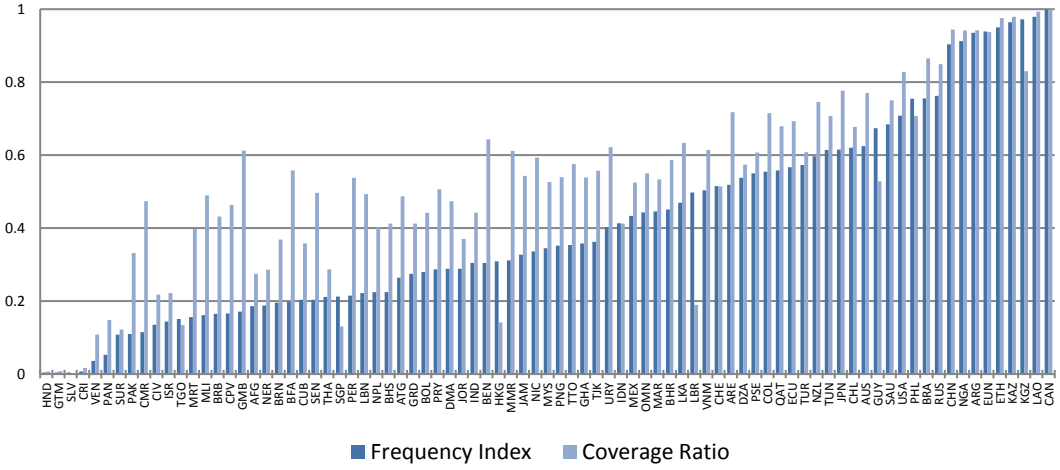
The above mentioned incidence measures are computed in this section using the most recent available data for all countries in the dataset. Rather than drawing normative conclusions, this section merely reports some stylised facts at the global and country levels.

[12] See https://vi.unctad.org/tpa/.

Figure 2.2 presents the Frequency Index for every country available in the dataset. The index takes values from almost 0 to 100 percent,[13] and normally Coverage Ratio is higher than Frequency Index, indicating that measures tend to be concentrated on the more heavily traded products.

Normally, national trade values are used as weighs for the Coverage Ratio, but this has two potentially offsetting problems. First, as mentioned above, countries may focus their regulatory efforts on products that have higher import values. In this way, there could be more regulation of products that are highly relevant in the import basket. Second, on the other hand, the more restrictive regulation is, the lower the volume of trade recorded for it. Following this logic, there could be less trade for products that are highly regulated (as a consequence, a prohibitive restriction receives a zero weight). This reduces the utility of the coverage ratio for inference about its effects on trade at national level, because the net effect of the positive and negative biases cannot be known a priori, expecting both higher and lower trade. It is then useful to compare the coverage ratio using national and international trade weighing, i.e. using world trade (instead of national) values for each product as weights.

Figure 2.2: Frequency and Coverage Ratios in the World

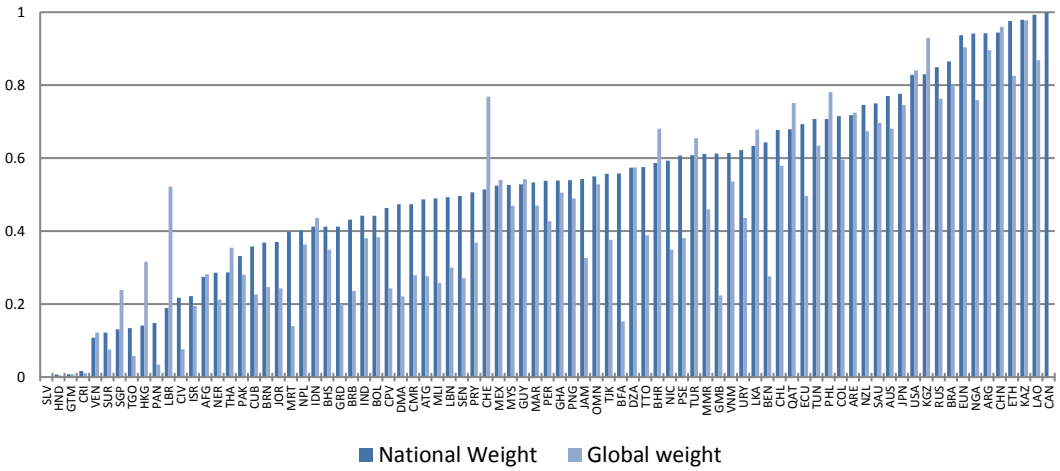


AFG=Afghanistan; ARG=Argentina; AUS=Australia; BEN=Benin; BFA=Burkina Faso; BOL=Bolivia (Plurinational State of); BRA=Brazil; BRN=Brunei Darussalam; CAN=Canada; CHL=Chile; CHN=China; CIV=Côte d'Ivoire; COL=Colombia; CPV=Cabo Verde; CRI=Costa Rica; CUB=Cuba; ECU=Ecuador; ETH=Ethiopia; EUN=France; GHA=Ghana; GMB=Gambia; GTM=Guatemala; HND=Honduras; IDN=Indonesia; IND=India; JPN=Japan; KAZ=Kazakhstan; KHM=Cambodia; LAO=Lao PDR; LBR=Liberia; LKA=Sri Lanka; MEX=Mexico; MLI=Mali; MMR=Myanmar; MYS=Malaysia; NER=Niger; NGA=Nigeria; NIC=Nicaragua; NPL=Nepal; NZL=New Zealand; PAK=Pakistan; PAN=Panama; PER=Peru; PHL=Philippines; PRY=Paraguay; RUS=Russian Federation; SEN=Senegal; SGP=Singapore; SLV=El Salvador; TGO=Togo; THA=Thailand; TJK=Tajikistan; URY=Uruguay; USA=United States; VEN=Venezuela (Bolivarian Republic of); VNM=Viet Nam.
Source: Authors' calculations, based on UNCTAD TRAINS database.

[13] See Box 3 on notes for graphs. It describes the statistical cleaning process applied on the raw data

Figure 2.3 shows Coverage Ratio computed using both global and national weights. As expected, it is more common that values for the Coverage Ratio are higher when using national weights, rather than global weights. This suggests regulation is concentrated on those products that are often imported. Of course, world trade weights reflect big countries' trade more closely and so one might think about a further weighting refinement which uses the unweighted average of the shares of each product in countries' import bundles – i.e. it disregards the size of each country's total imports. This is not done here. The standard values in most publications are usually based only on national weights.

Figure 2.3: Coverage Ratio

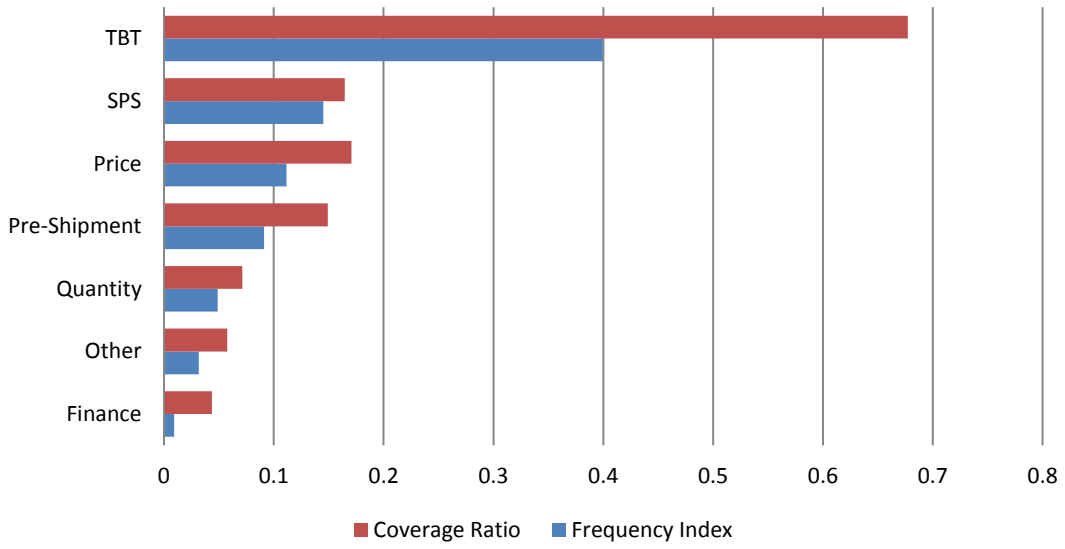


AFG=Afghanistan; ARG=Argentina; AUS=Australia; BEN=Benin; BFA=Burkina Faso; BOL=Bolivia (Plurinational State of); BRA=Brazil; BRN=Brunei Darussalam; CAN=Canada; CHL=Chile; CHN=China; CIV=Côte d'Ivoire; COL=Colombia; CPV=Cabo Verde; CRI=Costa Rica; CUB=Cuba; ECU=Ecuador; ETH=Ethiopia; EUN=France; GHA=Ghana; GMB=Gambia; GTM=Guatemala; HND=Honduras; IDN=Indonesia; IND=India; JPN=Japan; KAZ=Kazakhstan; KHM=Cambodia; LAO=Lao PDR; LBR=Liberia; LKA=Sri Lanka; MEX=Mexico; MLI=Mali; MMR=Myanmar; MYS=Malaysia; NER=Niger; NGA=Nigeria; NIC=Nicaragua; NPL=Nepal; NZL=New Zealand; PAK=Pakistan; PAN=Panama; PER=Peru; PHL=Philippines; PRY=Paraguay; RUS=Russian Federation; SEN=Senegal; SGP=Singapore; SLV=El Salvador; TGO=Togo; THA=Thailand; TJK=Tajikistan; URY=Uruguay; USA=United State; VEN=Venezuela (Bolivarian Republic of); VNM=Viet Nam

Source: Authors' calculations, based on UNCTAD TRAINS database.

Figure 2.4 shows average values for both Frequency Index and Coverage Ratio in every Chapter of the NTM Classification, and for all countries combined. The types of measures that are most often used across the board (and not for a specific sector) are TBT. Two thirds of trade are affected by TBT measures. As expected, SPS measures are used for a narrower group of products; these are typically only agro-food products. These measures affect around sixteen per cent of trade. The non-technical ones, especially Quantity and Price measures and Pre-Shipment measures, also apply to a sizeable share of trade. Combined, they affect almost a quarter of global trade.

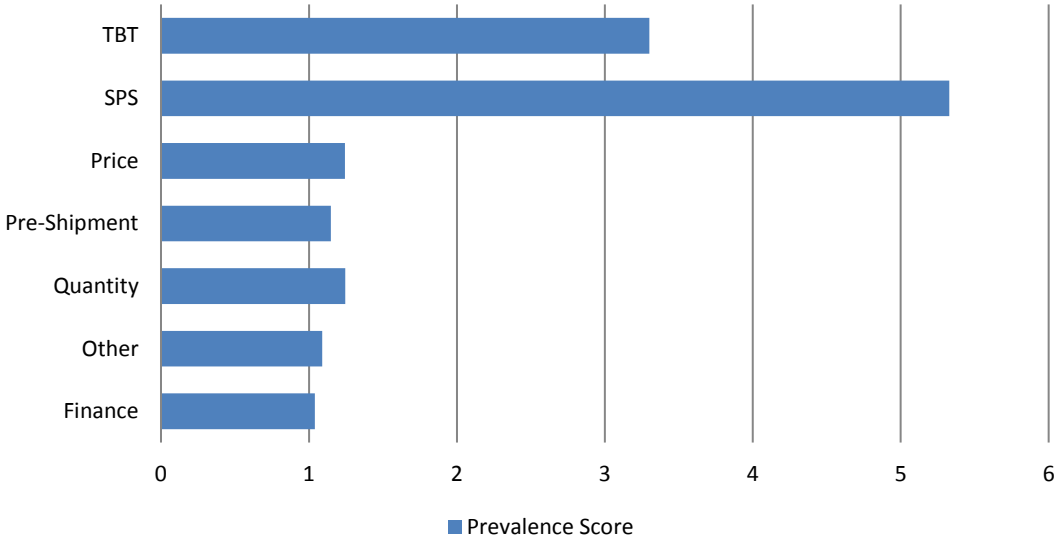
Figure 2.4: Frequency Index and Coverage Ratio by NTM Chapter



NTM = non-tariff measure; SPS = sanitary and phyto-sanitary; TBT = technical barriers to trade.
Source: Authors' calculations, based on UNCTAD TRAINS database.

When it comes to the counting, i.e. the number of different measures that are imposed on any single product, it is SPS measures that have the highest values: an average higher than five measures per product (counting each different type of code only once per product). There are more than three TBT measures on a product on average, and one of each of the other categories. This is computed on products that are traded with at least one country (the average includes zero values for those products with no NTM, and does not include all those measures that affect the products partially. See Box 3 for more details).

Figure 2.5: Prevalence Score by NTM Chapter

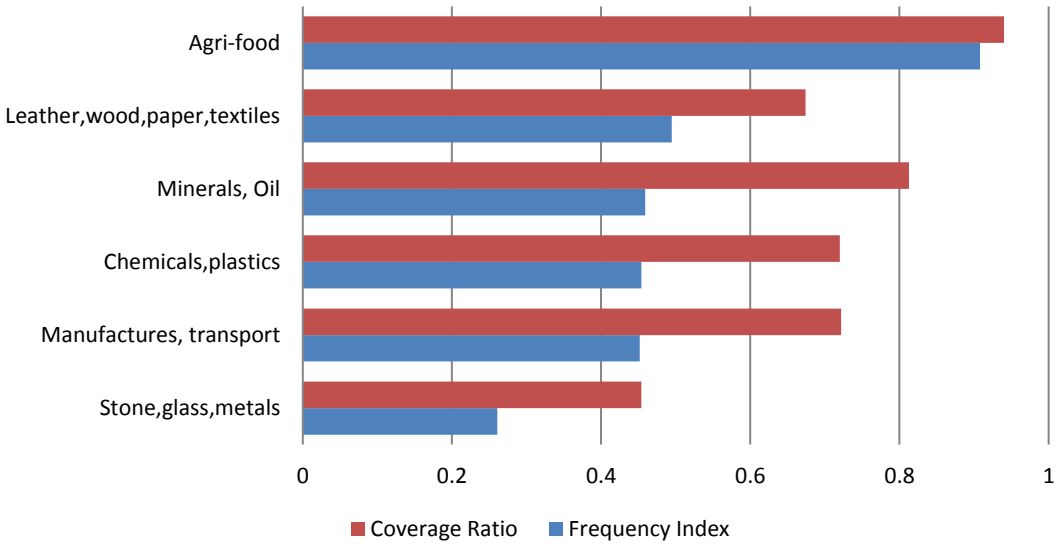


NTM = non-tariff measure; TBT = technical barriers to trade; SPS = sanitary and phyto-sanitary.
Source: Authors' calculations, based on UNCTAD TRAINS database.

Those values show that, while non-technical measures are widely used, the technical and especially the SPS measures are used more intensively, and could pose supplementary difficulties for traders to comply with each of them. This lends support to the idea that using this Prevalence Score as a variable in economic models may have more explanatory power that a binary Frequency Index or Coverage Ratio.

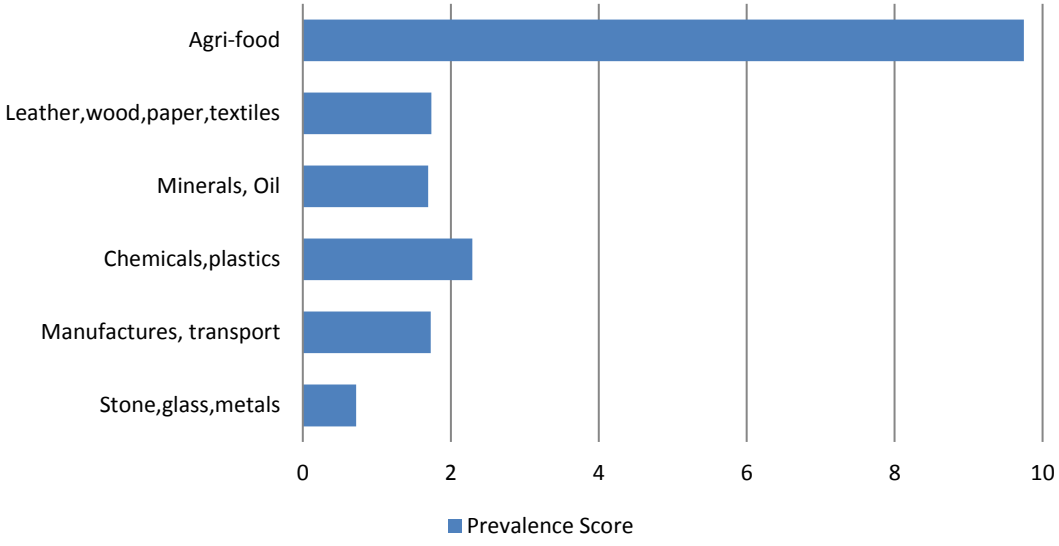
Figures 2.6 and 2.7 show information by sector. The agro-food sector appears to be the most regulated. Almost every product in this sector faces at least an NTM, and also it has the highest score for the number of measures affecting every product. There are almost ten measures on average on any product in the agro-food sector. For the rest of the sectors, they only face one or two, on average. Still, those measures affect about half of the traded lines in those sectors and a larger share of trade, indicating that countries tend to regulate more those products that are most traded in their countries.

Figure 2.6: Frequency Index and Coverage Ratio for Sectors



Source: Authors' calculations, based on UNCTAD TRAINS database.

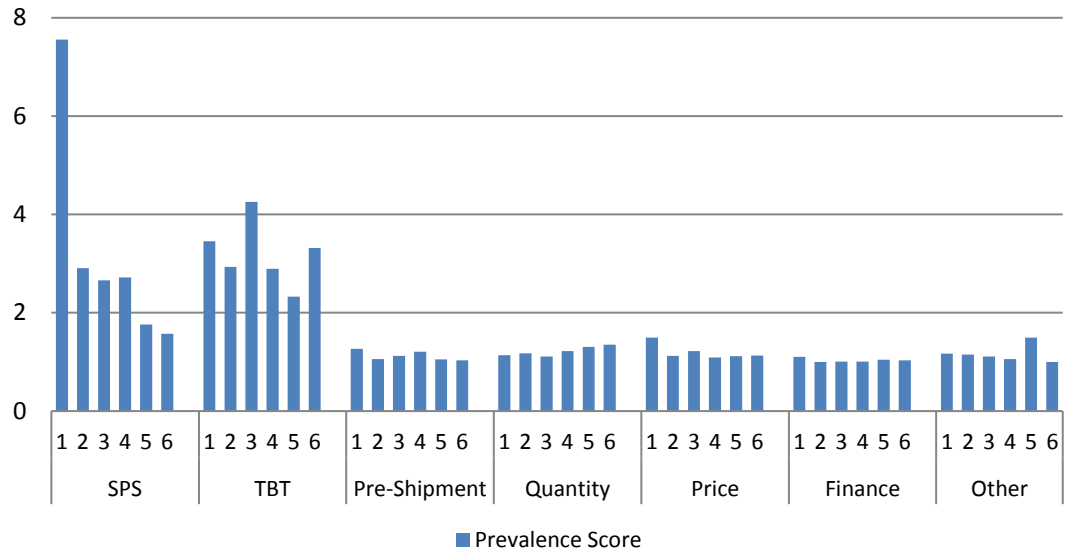
Figure 2.7: Prevalence Score Average Number of Measures



Source: Authors' calculations, based on UNCTAD TRAINS database.

In Figure 2.8, information on Prevalence Score is disaggregated by chapter and product group. SPS measures, which are very common on agro-food products, have the highest average number of NTMs. There are almost eight SPS measures, on average, on every product in the agro-food sector. There are SPS measures on other products as well, and their number is not negligible, especially on chemicals and plastics, and the sector grouping Leather, Wood, Paper, and Textiles, and Minerals and Oils. Measures from the TBT chapter are also in ample use, especially on chemicals and plastics, but there are TBT measures on agro-food products and manufactures as well. In general, the manufactures group is affected more by TBT measures than by any other type of measure, and TBT measures are widespread across the board.

Figure 2.8: Average Prevalence Score by NTM Chapter and Product Groups



NTM = non-tariff measure; SPS = sanitary and phyto-sanitary; TBT = technical barriers to trade.
Sectors: 1 = Agri-food; 2 = Minerals, Oil; 3 = Chemicals, plastics ; 4 = Leather, wood, paper, textiles ; 5 = Stone, glass, metals ; 6 = Manufactures, transport.
Source: Authors' calculations, based on UNCTAD TRAINS database.

Box 3: Notes for Graphs

1. All figures are done using only import measures. It can be interpreted as market access conditions. Nevertheless, for operators within the country, being importers, exporters, or producers, it could be relevant to see all measures – import and export
2. The indices are computed using the actual trading basket of the country – their actual imports, in this case. This means that if Frequency Index is lower than 1, there are products being imported that do not have any regulation. Calculations use the average trade import value for years 2014, 2015 and 2016
3. Computations uses bilateral NTM data. The bilateral trade value is considered in each case for the Coverage Ratio (national weighing)
4. To show more variation in the data, those measures that are 'horizontal' are dropped. These are the measures that are applied across the board, and not for a specific group of products (specifically, those single measures affecting at least 95 percent of the products in a country). This avoids the Frequency Index and Coverage Ratio equalling 1 when these are used, which are usually of more of an administrative nature. They are indeed mandatory, and they should remain in the database, but they are not included in the computation of the figures here to highlight the variability across countries and products groups.
5. Furthermore, those NTM that are applied under 'Partial Coverage' are also dropped to ensure consistency in the data across countries (UNCTAD, 2019 forthcoming). The raw NTM data report which specific products are affected at Tariff Line level, which is more finely disaggregated than the HS 6-digit level used here. This admits the possibility of selecting as 'affected' either any product with at least one tariff line effected, or other options, such as considering those HS-6 products that have some desired minimum share coverage, say 50 percent coverage at HS-6 level. This is expected to result in a higher Frequency Index and Coverage Ratio. However, this is not done here. In this note, only products with all its tariff lines affected within a HS-6 are considered 'affected' products.
6. Prevalence Score is computed counting only once each distinct NTM code on every product. If any measure code appears multiple times in the original database on the same product, they are included in the average count only with value equal to 1. There are some countries that present systematically higher numbers of measures. The reason for the existence of higher numbers of measures of the same kind (same NTM code) on one single product lies largely in the legislative structure of each country, as some countries disaggregate affected products below the HS 6-digit level in their regulations, while others take broader groups for the same kind of requirement.

Source: Authors' calculations, based on UNCTAD TRAINS database

6. Conclusions

Despite the widespread use of NTMs, there is still a significant transparency gap. Systematic and comparable information about the use of NTMs in government policy is generally not available. However, building a comprehensive NTMs database requires a very significant coordination effort and large resources. The NTM database is a global public good, designed to enhance transparency and benefit all countries of the world. UNCTAD leads and coordinates

the global effort on NTMs to fill the gap, setting the standards for data collection processes across countries. However, the implementing and financing partners are just as central to the endeavour.

As this chapter has shown, the collected data are based on a comprehensive set of mandatory and official regulations that are currently imposed by the country and that affect imported or exported merchandise products. Detailed information for each NTM comprises the sources of information, the measures, and the affected products and countries; these have all been gathered and translated into a qualitative and quantitative database to facilitate general access to all the policy measures that might have an economic impact on trade.

Developing the MAST classification is also a continuous effort. The MAST group met in September 2017 to consider needed changes in the classification, plus the possibility of adding new chapters, e.g. on government procurement, rules of origin, subsidies, or intellectual property. Not all of these areas will necessarily be included in the second version of the NTM classification; that will depend on the agreement of the experts and on the possibilities of collecting good quality data.

The study of the data collected allows a much broader menu of analysis than has been available heretofore and thus also enhances the range and quality of policy advice that is possible. The relatively scarce knowledge of the implications of NTMs, compared to tariffs, is particularly troubling for policymakers, trade negotiators, and development agencies, which need information and analysis so as to direct their efforts for maximum gains. Furthermore, NTMs are complex and their effect on regional and international trade is often indirect and very case-specific.

The incidence measures and the AVEs proposed in this chapter are informative by themselves, and may be used to study the regulatory practices in different regions, or specific sectors. These variables may also be used in other economic models that to date have lacked the NTM dimension. Thus, for example, the database supports a new research agenda on the effects of NTMs on trade and its responsiveness to shocks, and, more controversially, on the determinants of the extent and protective effect of NTMs.

The database also provides a basis for a series of case studies of specific sectors/country pairs. These will require researchers to delve more deeply into the characteristics of the NTMs than the database itself can do, but the latter will provide a definitive list of what official barriers there are and also the broader context in which the country/sector under investigation operates.

One specific case study that commands attention is the United Kingdom's plan to leave the European Union. If, as seems likely, this entails the United Kingdom leaving the European Single Market, we will have an immensely valuable natural experiment for the role of NTMs. Maintaining the completeness of the database will require an effort to identify any new NTMs and eliminations of NTMs that arise (or changes in the span of those that already exist), but the prospect of being able to use the shock to identify the effects of changes in NTMs should make the early and careful documentation of the NTMs in question a high priority. Of course, the effects of the exit will mainly impinge upon the United Kingdom, but it is potentially of

interest to any country that trades with the European Union or the United Kingdom (i.e. every country).

Concerning the result of the computed incidence values using the NTM database shown above, the perception that trade is highly regulated is reaffirmed. For example, it is rare to find any product in the agro-food sector without any NTM, and at the same time this sector has the highest number of measures applying simultaneously to the products. The second conclusion from this preliminary overview is that TBT measures are widespread across all products, and are used quite often by countries. The TBT measures cover 70 percent of world trade. The other types of measures are less numerous but nevertheless cover a sizeable share of trade as they appear to be concentrated on the products that are most traded by countries.

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