„Non-Tariff Barriers to Trade and the WTO Regulations”

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By:
Abiyot Geneme Gebre¹
Hinrich-Wilhelm-Kopf-str.4
21337 Lüneburg/Germany
E-Mail: abiyot.geneme@gmail.com

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¹ Abiyot Geneme Gebre holds an M.A. degree in Public Policy and Good Governance Program majored in Public Economics, Law and Politics from Leuphana University of Lüneburg in Germany, a B.A. degree in Economics from Arbaminch University in Ethiopia, and Diploma in Banking and Finance from Bahir Dar University in Ethiopia. He worked as an expert at the National Economic Account Directorate, and Development Planning and Research Directorate at the Ministry of Finance and Economic Cooperation in Ethiopia. The author is very grateful to his friends and colleagues, for their valuable comments and suggestions during this study.
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## Glossary of Terms

- **EC**: European commission  
- **GATT**: General Agreement on Tariffs and Trade  
- **NTB**: Non-tariff Barriers  
- **NTM**: Non-tariff Measures  
- **OECD**: Organization for Economic Cooperation and Development  
- **TBT**: Technical Barriers to Trade  
- **TRQ**: Tariff Rate Quota  
- **UNCTAD**: United Nations Conference on Trade and Development  
- **VER**: Voluntary Export Restraint  
- **WTO**: World Trade Organization
1. Introduction

Over the last few decades, multilateral trade negotiations have helped to substantially reduce in the use of tariffs as barriers to trade. Tariffs on international trade are generally reduced, as they have been progressively liberalized, first under the help of the GATT/WTO and subsequently in the context of numerous regional and bilateral preferential trade agreements.

However, the decline in tariff rates has raised the relative importance of non-tariff barriers, which are used now more than ever before as both protectionist and regulatory trade instruments to control the free flow of international trade. Restrictions on international trade, primarily in the form of non-tariff barriers, have increased rapidly in the 1980s. Non-tariff barriers (NTBs) include a very diverse range of strategies that countries apply to imported and exported goods. Some non-tariff barriers are clearly employed as instruments of commercial policy such as quotas, subsidies and export restrictions, while others stem from non-trade policy objectives. The latter often serve a legitimate purpose as they are put in place for valid concerns such as food safety and environmental protection.

Despite common perceptions about a rising trend in non-tariff barriers to trade, evidence is inconclusive. The aim of this study is to analyze a great deal of information about the non-tariff barriers to trade and their meaning/significance in the WTO-regulations. Therefore, the central element of the analysis of the paper is to review and discuss a wide verity of non-tariff barriers to trade, the regulations of non-tariff barriers to trade under the GATT/WTO and issues related to the quantification of the effects of non-tariff barriers on trade flows.

Thus, in order to achieve the objective, the analysis is structured as follows: The first section highlights the concepts of non-tariff barriers and identifies different categories of non-tariff barriers to trade. The second section reviews a brief account of non-tariff barriers to trade under the GATT and the WTO, followed by a detail review of issues related to the importance of non-tariff measures from empirical evidence in section three. The fourth section will discuss the quantification of the impact of non-tariff barriers in restricting international trade. Finally, there will be some conclusions and implications for policy.

For the purpose of data gathering, the study will rely on world trade reports, journal articles, internet sources, news, documentaries and other relevant material to the study. Authors whose works are relevant to the study will be used. It is also important to note that the terms ‘non-tariff barriers’ (NTBs) and ‘non-tariff measures’ (NTMs) are used interchangeably in this study. Although both terms are often used interchangeably in the academic literature, the term non-tariff barrier is more commonly used in numerous academic literature.
2. Definition and Classification of Non-tariff Barriers (NTBs)

This section provides an overview of the definition and a wide variety of non-tariff barriers to trade. It first illustrates the definition of non-tariff barriers and then briefly discusses various categories of non-tariff barriers. The analysis in this section also highlights some historical count of non-tariff barriers (NTBs). The concept of non-tariff barriers can be defined in various dimensions. This is to say that, there is no agreed definition in the WTO what non-tariff barrier or non-tariff measure actually is. However, various scholars and institutions have given definitions and descriptions what non-tariff barriers/measures actually mean.

According to different scholars and institutions, the concept of non-tariff barriers/measures are generally defined as restrictions that result from prohibitions, conditions, or specific market requirements that make importation or exportation of products difficult and/or costly. That is, it is in a broad sense defined as all measures other than tariffs that have an impact on trade flows. More precisely, a tariff is a tax imposed on foreign goods as they inter in a country, non-tariff barriers, on the other hand, are non-tax measures imposed by governments or authorities to favor domestic suppliers over foreign suppliers.

Similarly, according to the WTO definition, non-tariff measures arises from different types of measures other than tariff measures taken by governments and authorities in the form of government laws, regulations, policies, conditions, restrictions or specific requirements, and private sector business practices, or prohibitions that protect the domestic industries from foreign competition. However, it is also important to consider that such instruments may or may not affect trade flows because the application of non-tariff measures does not always restrict trade and also not all measures affecting trade are implemented with discriminatory or protectionist purposes.

However, when considering non-tariff barriers, it is interesting to ask why governments might prefer them over tariffs. According to the Deardorff and Stern explanation, one of the reasons why governments prefer non tariff measures over tariffs is that governments perceive that tariffs will not work effectively in reducing imports. As a whole, the definition of non-tariff measures includes ‘border measures’ (such as customs procedures, etc) as well as ‘behind-the-border measures’ that impede trade in goods and services flowing from domestic laws, regulations and practices.


With regard to category/classification of non-tariff measures, since the definition of non-tariff measures is very broad, discussing a detailed classification is very important in order to better identify the various forms of non-tariff measures. At a broad level, the majority of non-tariff measures (NTMs) fall into three categories and the categorization is depending on their scope and/or design. The first categories of NTMs are those imposed on imports. This category includes import quotas and prohibitions, import licensing, and customs procedures and administration fees.

A second category of non-tariff measures are those imposed on exports. These include export taxes, export subsidies, export quotas, export prohibitions, and voluntary export restraints. These first two categories encompass NTMs that are applied at the border, either to imports or to exports. A third and final category of NTMs are those imposed internally in the domestic economy. Such behind-the-border measures include domestic legislation covering health/technical/product/environmental standards, internal taxes or charges, and domestic subsidies.

Although it is difficult to find a comprehensive picture of the classification of possible NTMs, an impressive collection of studies compiled by the OECD provides a view of the range, complexity and diversity of NTMs in practice (Staiger, 2012). The study contained in this collection sets out to assess the relative importance for the post-Uruguay Round landscape of the various kinds of non-tariff measures imposed on imports as these measures are perceived by foreign exporters and recorded in various survey results. The survey result shows that the technical measures and customs rules and procedures, respectively, rank these barriers high. Besides to this, internal taxes or charges and competition-related restrictions on market access are reported, these are also often among the top non-tariff measures. Although less often mentioned, restrictions for services in general rank high in three out of the five surveys that report them.

Another study in the OECD collection has also provided a brief review on NTMs that are of particular impotence to developing countries. In this regard, the existing evidence describes that the utilization of certain types of NTBs affecting developing countries, such as quantitative restrictions, has decreased markedly in the post-Uruguay Round negotiations. However, based on frequency ratio analyses, the remaining post-Uruguay NTBs appear to be more prevalent in

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4 R.W. Staiger (2012), Pp.2-4
5 Ibid.
7 OECD (2005), Pp.23.
developing countries than in developed country markets, although they have decreased over time.\(^8\)

And importantly, the trade measures and chapters of the new classification of non-tariff measures by UNCTAD has also presented in the table 1 below. The UNCTAD classification of NTMs develops a branch structure where measures are categorized into import and export measures and their chapters, depending on their scope and/or design. Each chapter is furthermore differentiated into several subgroups to allow a better classification of the regulations affecting trade. The classification of non-tariff measures encompasses 16 chapters (from A to P), and each individual chapter is divided into groupings with depth up to three levels/digits.

Table 1: The Measures and Chapters of the new NTMs classification.\(^9\)

\begin{center}
\includegraphics[width=\textwidth]{table1.png}
\end{center}

\textbf{Source: UNCTAD Secretariat, (2012)}

As we shall see from the table in the above, according to the UNTCAD, chapter A deals with sanitary and phytosanitary measures, which are generally referred to as SPS. It gathers measures such as restriction for substances and ensuring food safety, and those for preventing dissemination of disease or pests. Chapter A also includes all conformity-assessment measures related to food safety, such as certification, testing and inspection. Chapter B collects technical terms to trade measures, also called TBT. As in the case for SPS, chapter B also includes all conformity-assessment measures related to technical requirements, such as certification, testing and inspection. The last chapter in the technical measures section is chapter C, which classifies the measures related to pre-shipment inspections (PSI) and other customs formalities. In

\(^8\) ibid

\(^9\) A detailed list of new NTMs classifications is available at \url{http://ntb.unctad.org}.
addition, chapter D to O deals with non-technical measures to trade and the final chapter (chapter P) deals with measures related to export measures including export subsidies. This may well serve as a starting point for our understanding of the NTBs. We now in the forthcoming section review a brief history of non-tariff barriers to trade under the WTO.

3. The Regulation of Non-tariff Barriers (NTBs) to Trade in the WTO

This section, briefly reviews the historical account of NTBs in the WTO regulations. It is mainly overviews the evolving approach to non-tariff barriers in trade agreement taken by the GATT and the WTO. And, the discussion below focuses first on approaches taken by the GATT and then we discuss the approach taken by the WTO. It is also important to note that the discussion first considers the border non-tariff measures (i.e., in both import and export measures) and then we turn to assess behind-the-border non-tariff measures taken by the GATT/WTO.

**The GATT Approach:** The GATT adopted a particular and minimalist approach to handling NTMs in trade agreement in general. In one of his studies, Staiger (2012) indicates that, with regard to the border non-tariff measures (NTMs), the GATT approach to border NTMs differs on the import side and the export side. According to the Staiger12, the approach can be loosely characterized as follows;

On the import side, GATT was designed to serve as a negotiating forum in which reciprocal, voluntary and nondiscriminatory (MFN) tariff bargaining among member governments would lead to tariff “bindings”. Of course, tariff bindings in themselves are not likely to be valued by governments. But it was anticipated that these bindings would imply meaningful increases in market access for foreign exporters, and for this reason would be valued by the participating governments.

However, as Hudec13 (1990) cited in Staiger describes, the drafters of GATT were highly aware that policies other than tariffs could easily substitute for tariffs and might become tempting in this role once a country constrained/bound its tariffs as a result of a negotiation. And the drafters understood that if left unchecked these NTMs could undermine the value of a negotiated tariff binding and hence the foundation of the negotiating framework they sought to create.

Thus, for this reason, while member governments do not negotiate directly over the level of NTMs in GATT as they do over tariffs, GATT contains numerous provisions (e.g., a prohibition on the use of quantitative restrictions) that are designed to induce “tariffication” of import-

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10 See also UNCTAD secretariat report (2013) for a detail review of the new non-tariff measures classification.
12 Ibid, pp.8.
protective measures and prevent the substitution of alternative forms of import protection for tariffs.  

And also, according to the Staiger, on the export side of the NTMs, GATT was far more permissive in part because it was not anticipated that GATT member governments would actively engage in negotiations over export-sector liberalization commitments (say on export taxes and export subsidies). Most importantly, at least with regard to developed countries, export taxes were less often used than import tariffs, and so they may have been seen as a less-pressing issue for the world trading system at the time of GATT’s creation. In addition, early GATT disciplines were very permissive with the issue of export subsidies though they have tightened over time.

With regard to the GATT approach on behind-the-border non-tariff measures, the GATT approach dealing with behind-the-border NTMs can also be described as a minimalist or “shallow integration” approach. In the GATT, member governments do not negotiate directly over behind-the-border NTMs as with border NTMs. But there are several provisions that are meant to protect the value of negotiated market access agreements against erosion by behind-the-border NTMs.  

As a whole, GATT rules on non-tariff measures are consistent with a shallow integration approach. They directly regulate tariffs and other border measures, but impose no regulation on domestic measures other than a non-discrimination obligation. They just aim at ensuring that government or authorities have the capability to use NTMs to achieve legitimate public policy purposes, as long as they do not replace bound tariffs with non-tariff measures. This is the core historical account of GATT’s approach to border and behind-the-border non-tariff measures.

**The WTO Approach:** The approach to NTMs has changed from the GATT to the WTO in general. Since the WTO was established on January 1, 1995, it has produced the most fundamental reform of the world trading system. The WTO agreements which are the outcome of the 1986-1994 Uruguay Rounds of multilateral trade negotiations introduced disciplines on a wider range of trade issues and testify to the wider and deeper commitment to trade liberalization.

The scope of these agreements go beyond the traditional trade issues which primarily addressed reducing tariffs and quotas as barriers to trade on goods at country boarders but were extended to cover the other forms of NTBs. In recent periods, a numerous of non-tariff barriers are subjected to a number of multilateral and legally binding WTO rules and agreements. These agreements

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14 See also Staiger (2012) for detail explanation.  
15 Ibid  
deal with technical and bureaucratic measures or legal issues that could involve hindrances to trade or be used as instruments for restrictive and discriminatory trade policies.

As a whole, the Agreements on Technical barriers to trade, Anti-dumping, Subsidies and Countervailing Measures, Import Licensing, and Customs Valuation are modified and amended versions of the agreements concluded at the end of the Tokyo Round (1973-79). That is, they were binding only on those parties that have accepted them. However, after the Uruguay Round (1986-94), they have acquired “multilateral” status, i.e. they became binding on all members. On the other hand, the Agreements on Sanitary and Phytosanitary Measures, Pre-shipment Inspection, and Rules of Origin are the results of the Uruguay Round and they shall also be applied by all the WTO member states.

With regard to the WTO approach on border non-tariff measures (NTMs), the WTO approach to border NTMs indicates a significant tightening of obligations relative to GATT along a number of dimensions. For example, the WTO Safeguard Agreement prohibits the use of various forms of border NTMs (e.g., Voluntary Export Restraints) that were considered “grey-area” measures under GATT and had become popular in the last decade of GATT before the creation of the WTO. And also, the WTO Subsidies and Countervailing Measures (SCM) Agreement strengthens significantly the prohibition against export subsidies.\(^{17}\)

With regard to the WTO approach on behind-the-border NTMs, the WTO approach also describes a significant tightening of obligations relative to GATT along a number of dimensions. For example, the WTO Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary Measures (SPS) Agreements represent a significant strengthening of the non-discrimination/national treatment obligations regarding certain kinds of domestic regulations. In addition, the WTO Subsidies and Countervailing measures Agreement contains substantial commitments regarding domestic subsidies that were not included in GATT.\(^{18}\)

In general, while the overall approach of the WTO with respect to behind-the-border NTMs can still be characterized as one of shallow integration, there has been some evolution over the history of the GATT in the direction of deep integration. Hence, this study could also take the position to argue that, although there has been evolution over the history of the GATT in the direction of deep integration, the WTO approach to the treatment of non-tariff measures could not adequate for the world economy of today.

\(^{17}\) R.W. Staiger (2012), Pp.11.
\(^{18}\) Ibid.
3.1. Review of Non-tariff Measures from Empirical Evidence

This section reviews first the most frequently used forms of non-tariff measures related to technical measures affecting international trade, including Sanitary and Phytosanitary measures, Technical barriers to trade and Pre-shipment inspections and then review some studies related to other forms of NTMs, such as Rules of origin, State trading enterprises, Anti-dumping and Tariff rate quotas.

Sanitary and Phytosanitary (SPS) measures and Technical Barriers to Trade (TBTs): The SPS agreement was formed on the TBT Agreement, which was initially negotiated under the GATT during the Tokyo Round negotiations (1973-1979).\(^\text{19}\) The SPS Agreement was intended to address measures designed to protect human, animal and plant life and health from risks. For example, to protect human or animal life arising from additives, contaminants, toxins or disease-causing organisms in their food; To protect human life from plant- or animal-carried diseases; to protect animal or plant life from pests, diseases, or disease-causing organisms; to prevent or limit other damage to a country from the entry, establishment or spread of pests; and to protect biodiversity.

The SPS Agreement contains Article 5.7 which allows temporary “precautionary” measures.\(^\text{20}\) The Agreement further contains rules, in Article 3, encouraging, but not obliging, members to harmonize their SPS measures around international standards. TBTs address all other technical regulations, standards and conformity assessment procedures imposed with a non-trade objective (i.e. to ensure safety, quality and environmental protection, etc) (UNCTAD secretariat report, 2012). The SPS measures and TBTs are addressed in two important WTO agreements, which impose disciplines that go beyond the usual non-discrimination.\(^\text{21}\) Independently from their objective and legal frameworks, SPS measures and TBTs can have important economic effects on international trade. These measures often increase fixed and marginal trade costs and/or production costs.\(^\text{22}\)

According to the UNCTAD, from an economic standpoint, not all SPS measures and TBTs have a negative effect on international trade.\(^\text{23}\) Some may reduce trade costs by streamlining information regarding the safety, quality and specifications of products between trading partners and ultimately the information provided to consumers. However, in practice, the effect of SPS and TBT measures on trade can be quite diverse, “while some of the effects of SPS measures and

\(^\text{22}\) United Nations Secretariat, Non-tariff Measures to Trade: Economic and Policy Issues of Developing Countries, UNITED NATIONS PUBLICATION, ISSN 1817-1214, 2013, pp.27. Geneva, Switzerland.
\(^\text{23}\) ibid
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TBTs are linked to trade creation and some are linked to trade diversion.”

In general, the use and incidence of these measures seems to be increasing faster in developed countries than in developing countries with stricter social regulatory framework.

**Pre-Shipment Inspection:** Pre-shipment inspection (PSI) activities are all activities relating to the verification of the quality, the quantity, the price, including currency exchange rates and financial terms, and/or the customs classification of goods to be exported to a country (Art.1). And also, the obligations of PSI-user members include non-discrimination amongst exporters (Art.3). In addition, the Agreement establishes an independent review procedure to resolve disputes between exporters and PSI entities (Art.4). PSI is, by definition, carried out prior to shipment on the territory of an exporter country, and only in exceptional circumstances in a country of the manufacturer. The purpose of this practice is to safeguard national financial interests such as prevention of capital flight and commercial fraud and evasion of customs duty, and to compensate for inadequacies in administrative infrastructures.

In this activities, the independent and specialised PSI companies guarantee that the goods conform to the terms of the sales contract and also that the declared invoice price is the actual transaction price. This means that there has been no under pricing or overpricing. In doing so, governments aim to prevent capital flight through overpricing, and/or any loss in customs revenue as a result of undervaluation or miss-classification of the goods. In this manner, the PSI Agreement recognizes the need to establish an agreed international framework of rights and obligations of member countries using services provided by pre-shipment inspection entities (PSI entities). The main objective of the Agreement is to provide transparency of the activities, laws and regulations of PSI entities.\(^{25}\)

In one of their interesting study, Anson, Cadot, and Olarreaga (2006) shows that whether PSIs help to reduce tariff evasion or not. That is, they investigate whether PSI programmes are an effective way of improving tariff revenue collection and of reducing fraud when customs administrations are inefficient. Hence, the authors finding shows that the introduction of PSIs may not mitigate the level of fraud, in particular when PSI data is not systematically reconciled with customs data by national authorities. Besides to that, the authors study identifies two diverse effects related to the introduction of PSIs: the first one is that, “PSIs directly generate information useful for detecting possible tariff evasion schemes”; secondly, “PSIs may provide disincentives for additional custom controls as they may act as a strategic substitute for customs administration”. Lastly, the authors finding show that the effect of PSIs can also be negative because PSI services are generally expensive.

\(^{24}\) ibid

\(^{25}\) O. Gürlar, 2002, PP.70-73.
**Rules of Origin:** Rules of origin is one of the classifications of non-technical measures in the GATT/WTO. It is the criteria needed to determine the national origin of a product (where a product was made). By definition, each product can only originate in one territory. This conventional definition is known as the single country of origin. It is based on the idea that when country A exports a product to country B, and country B, after further processing, exports it to country C, this trade is considered as the export of country B to country C without considering the contribution of country A in this trade. International trade statistics and analysis are, in general, based on this conventional definition. In fact, such a trade exchange overestimates the exports of country B while underestimating the role of country A in the world trade. However, in today’s complex world, defining the origin of a product is not always an easy task.

The purpose and effect of rules of origin is that it subjects certain imported products to discriminatory policies and measures depending on their origin. In order to prevent and minimize the use of rules of origin, the WTO came up with an Agreement on Rules of Origin to regulate the determination of the national origin of goods in international commerce. The objective of the Agreement is to ensure that rules of origin are not abused and implemented to restrict trade. In addition, it seeks to secure transparency of laws, regulations and to facilitate trade. Moreover, a committee on Rules of Origin constituted by representatives of WTO member states and until the completion of the harmonization programme, members states are expected to ensure that their rules of origin are transparent; that they do not have restrictive or distorting effects on international trade. In general, rules of origin are important in implementing trade policy instruments such as anti-dumping and countervailing duties, origin marking and safeguard measures.

**Import Licensing Procedures:** This is also one of the categories of the non-technical measures. It is less widely used method. Article 1 of the Agreement on Import Licensing Procedures defines import licensing as administrative procedures used for the operation of import licensing regimes requiring the submission of an application or other documentation to the relevant administrative body as a precondition for importation into the customs territory of the importing member country. The present WTO Agreement on Import Licensing Procedures is a modification of the Tokyo Round ‘Import Licensing Code’ with the objective of preventing import licensing procedures from unnecessarily hindering international trade. That is, the main objective is to simplify and bring transparency to import licensing procedures without any restrictive or distorting effects on international trade.

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State Trading Enterprises: State trading enterprises (STEs) are enterprises authorized to engage in trade (exporting and/or importing) that is owned, sanctioned or otherwise supported by government. They are legitimate trading entities, subject to WTO definition and rules. It was agreed during the Uruguay Round to inform the GATT Secretariat about all enterprises that answered the description of state trading enterprises. According to the UNCTAD, from an economic standpoint, STEs do not have an unambiguous effect on trade, because they are simply instruments through which governments control market structures as a mean of redistributing income between producers, consumers and taxpayers. However, in practice, governments use them to regulate markets as a means to implement redistributive policies. Generally, their effect on international trade is often suboptimal and their reform may expand market access and reinforce the benefits of international trade. In fact, an important issue of consideration in relation to STEs is that their redistributive purpose indirectly creates rents which may increase corruption and inefficiencies in a certain country.

Anti-Dumping: is also one of the categories of non-technical measures to trade. In this measure, a firm is considered to be dumping if it exports a product at a lower price than the value of the product on its own domestic market. In a worst-case scenario, dumping can even act as a predatory price practice, forcing established domestic producers out of a market and leading to monopolistic positions by the exporting firm. Domestic firms may counteract dumping practices by filing anti-dumping petitions.

However, according to the UNCTAD, the anti-dumping procedure is complex and regulated by a specific WTO agreement. The agreement does not pass judgment, but provides guidelines as to how a government can or cannot respond to dumping. When dumping is found, anti-dumping measures often result in the imposition of additional import duties so as to re-establish market prices. According to the UNCTAD report, more than 40 members of WTO are now active users of an anti-dumping policy and developing countries are some of the newest and most frequent users. Most importantly, concerning the implementation of the provision, the importing country is entitled to levy an anti-dumping duty equal to the differences between the normal value and the export price.

Import Quotas: Like tariffs, import quotas another protectionist instrument and an old form of trade restriction that came to existence since the Mercantilist era. According to the WTO terminology, import quotas are measures that are applied at the border and have a direct effect on imports. Quotas involve restrictions of imports of specified products by setting a maximum quantity or value of goods authorized for import.

An import quota implies a fixed quantity or value of a commodity that has been allowed to be imported in the country during a given period of time. In practice, quotas may be fixed either in terms of the physical volume or monetary value of imports or a combination of the two. Quotas assigned in quantitative terms are referred to as direct quotas and those expressed in value units implying exchange control, are called indirect quotas. The objectives of import quotas are to regulate imports in an effective manner, to protect domestic industries from severe foreign completion and to maintain and stabilize domestic price level by restricting import flows. There are also different types of import quotas exist: For example, a tariff rate quota (TRQ) is one of the types of import quotas. It combines two policy instruments: quotas and tariffs. Imports entering under the quota portion are usually subject to a lower (sometimes zero), tariff rate and also imports above the quantitative threshold of the quota face a much higher tariff. However, there is little empirical evidence of the impact of TRQ implementation practices on market access.

In general, one important point we need to consider here is that the use of non-tariff barriers has undergone many changes. Prior to the Uruguay Round (1986-94), import quotas and other quantitative restrictions in imports or exports were quite common across all countries. However, as studies conducted by OECD indicating that the incidence and importance of quantitative restrictions such as import quotas and voluntary restraint agreements and price control measures in OECD member countries has generally reduced over the last few decades.

4. Quantification of the Effects of Non-tariff Barriers on Trade

The discussion in the previous section focused on defining the concept, classifications, use and historical account of non-tariff barriers in the GATT/WTO. But obviously that cannot be the whole story. This section presents the relative importance and the effect of NTBs on international trade. There are various approaches for identifying the relative importance of NTBs and their effects particularly on international trade and welfare. However, in light of their wide varieties described in the above sections, there is no surprise that the quantification of the effect of NTBs is often complex and challenging practice.

What is special about non-tariff barriers is that tariffs effect prices and are analyzed within price/quantity, demand/supply framework, but non-tariff barriers often have uncertain effects on price and/or quantity. That means, it is harder to analyze. However, in order to estimate the impacts of NTBs on trade, various attempts have been undertaken using different methodologies.

30 Ibid
and data over the last decades, including frequency index and coverage ratio measures, price comparison measures and quantity impact measures, as well as residuals of gravity model type economic equations.\textsuperscript{32}

The frequency index accounts only for the presence or absence of non-tariff measures (NTMs) and summarizes the percentage of products to which one or more NTMs are applied. The coverage ratio is the percentage of trade subject to NTMs for the importing country and provides a measure of the importance and effects of NTMs on overall imports. Most importantly, up to date, one of the simple and most commonly used approaches to estimate or calculate the relative importance and the effect of NTMs on trade is the indicators of trade restrictiveness index. And, some of these most widely used indicators to measure the effect of NTMs on trade are those developed by Kee, Nicita and Olarreaga (2009) and implemented by the World Bank in its global monitoring reports. The indicators referred to as the overall trade restrictiveness index (OTRI) and market access OTRI (MA-OTRI).\textsuperscript{33}

These indicators provide the overall level of restrictiveness of the trade policies imposed (OTRI) or faced (MA-OTRI) by a country and are based on the estimation of ad-valorem equivalents of NTMs. That is, the approach taken by Kee, Nicita and Olarreaga is to estimate equivalents of NTMs for each country at the tariff level that can be compared directly to ad-valorem tariffs. Despite all of these difficulties in measurement, most estimates of the trade effects of non-tariff measures suggest that they can be substantial. That is, the existing evidence suggests that non-tariff measures can significantly restrict trade. For instance, Kee, Nicita and Olarreaga (2009) finding indicates that for a majority of tariff lines the ad valorem tariff equivalent of the non-tariff measures in their sample of 78 countries is higher than that of actual tariff.

Figure 1 shows the overall level of restrictiveness imposed on imports (OTRI) for high-, middle- and low-income countries. As we shall see in the figure, the contribution to overall restrictiveness of tariff measures and non-tariff measures is reported for every bar. Moreover, the figure also distinguishes between the broad economic sectors of agriculture and manufacturing. As this indicator shows, non-tariff measures are highly contributed to restricting international trade.

\textsuperscript{32} See A.V., Deardorff and R.M., Stern, 1997, for a detail review.
\textsuperscript{33} ibid
As we can see from the figure, in the case of high-income countries, NTMs add approximately 4 percentage points to the average tariff of just about 2 percent. And also, large differences in the restrictiveness of NTMs are observed between agricultural and manufacturing products, especially in high- and middle-income countries. Most importantly, as observed in the figure, NTMs are less preventive in low income countries than high-and middle income countries.

According to the international trade statistics, this is partly due to the fact that the trade policies of low income countries still largely rely on tariff restrictions, because non-tariff barriers administration is often more complex and costly to implement in low income countries. As a whole, based on the above analysis it is important to assume that non-tariff barriers contribution to overall trade restrictiveness is generally much higher than that of tariffs measures. However, as various international trade literatures indicate, the ad equivalent valorem approach has conceptual and methodological limitations. Particularly, in the presence of market uncertainty or when NTMs take the form of fixed market entry costs, non-tariffs could have equivocal/undetermined effects on tariffs that cannot be easily generalized. Besides to this, another weakness of ad valorem equivalents is that they only provide an estimate of the overall effect of non-tariff measures which cannot be decomposed by each measure.

5. Concluding Remarks

This study has provided an overview of the concepts and classifications of non-tariff barriers to trade and their meaning/significance in the WTO regulations. It has demonstrated that a quite number of GATT/WTO provisions are exists to address the issue of non-tariff barriers. The study, however, only concentrated on those main provisions with a direct and indirect effect to those non-tariff barriers to trade. These covers; Sanitary and Phytosanitary measures, Technical
barriers to trade, Pre-shipment inspections, Import licensing procedures, Subsidies and countervailing measures, Restrictive rules of origin, Anti-dumping duties and so on.

It has been also demonstrated that non-tariff measures have undergone changes over the history of the GATT in the direction of deep integration. That is, with the creation of the WTO, the trends in handling non-tariff measures was continued and extended in a number of important ways. It seems inescapable to conclude by saying that the WTO regulations played a significant role in reducing tariffs and other non-tariff measures applications on a number of products. However, this study could also argue that, even if there has been evolution over the history of the GATT in the direction of deep integration, the WTO approach to the treatment of non-tariff measures could not adequate for the world economy of today.

It has further demonstrated that non-tariff barriers have greater trade restrictiveness effect than do tariff measures. At the same time the study noted that the significant work of WTO in addressing non-tariff barriers (NTBs) needs to be done the economic effects of NTBs, as the current empirical and conceptual knowledge of these barriers remains somewhat unclear. In particular, this knowledge is hampered by lack of common methodologies and up dated information. Besides to these, establishing a unified method for quantifying NTBs are also remains a significant challenge. Finally, this study also assumed two main messages to international trade analysts and policymakers with regard to non-tariff barriers to trade. The first is that, given their importance but the still limited understanding of them, further research and analysis is very crucial. The second is that, a multilateral policymaking process is essential in order to minimize their distortionary and discriminatory effects on trade flows.

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