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DEEP REGIONAL INTEGRATION AND NON-TARIFF MEASURES: A METHODOLOGY FOR DATA ANALYSIS

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DEEP REGIONAL INTEGRATION AND NON-TARIFF MEASURES: A METHODOLOGY FOR DATA ANALYSIS

by

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UNITED NATIONS

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Abstract

In this paper we develop "tools" for policymakers to advance "deep" regional integration with respect to non-tariff measures (NTMs).

First, we develop a regulatory distance indicator to measure the similarity of NTM policies across countries and sectors. A quantitative approach which makes use of official NTM data to compare regulatory patterns is complemented by case-study approaches for a more detailed analysis. Policymakers can use these tools to assess the status quo of NTM-related regional integration and to benchmark progress.

Secondly, we employ a price-gap based technique to estimate the price increasing effect of NTMs. Worldwide averages of ad-valorem equivalents (AVEs) for all NTM types combined vary between 5 and 27 per cent across sectors; with the highest AVEs in the animal and vegetable sectors. SPS and TBT measures account for the bulk of these AVEs, especially in Europe. Other NTMs like quantitative restrictions remain relevant in Asia, Latin America and Africa, especially in food-related products and in some industrial sectors.

We also look at the estimation residuals to trace back from AVEs to more concrete and specific cases. Where the actual traded price of a product is higher than predicted by the model, a more-than-average restrictiveness of specific NTMs or monopolistic/oligopolistic markets are likely explanations. This approach may help to "flag" suspicious cases, but then requires going into deeper "on the ground" facts to find explanations. Furthermore, we explore the question about who pays the price for trade costs arising from NTMs. We derive anecdotal evidence from a specific example where the importer and foreign exporter can pass on the higher price to the final consumer or downstream producer in a value chain. This implies a low motivation for the actual trading partners to reduce certain trade barriers.

Lastly, we link AVEs to Kenyan household survey data on consumption patterns in order to evaluate welfare impacts. NTM-related costs increase the average cost of living by about 8 per cent. Furthermore, this impact is stronger for poorer people and weaker for richer people. This distributional effect is caused by the higher share of food items in the consumption basket of the poor.

Keywords: non-tariff measures, economic integration, welfare

JEL Classification: F14, F15

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The views expressed in this study are those of the authors and do not necessarily reflect those of the United Nations, its member States or GIZ. Any errors remain the authors' own.

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1. INTRODUCTION

Regional trade agreements (RTAs) have proliferated in the past decades. As of June 2014 some 585 RTAs have been notified to the WTO and more are currently negotiated. Important examples are also the so-called mega-regionals; the Trans-Pacific Partnership and the Transatlantic Trade and Investment Partnership. Since tariff liberalization alone has generally proved insufficient in providing genuine economic integration further attention has been drawn to non-tariff measures (NTMs).

The general focus of this paper is to present a range of methodologies that provide evidence to support policy makers in addressing NTMs. We conduct exploratory work in some areas and further research will have to further test and refine the innovative methods presented here. While the motivation for this paper is to strengthen "deeper" regional integration with respect to NTMs, most of the proposed approaches are also useful in unilateral, bilateral or multilateral contexts.

NTMs include a wide and diverse array of policies that countries apply to imported and exported goods. Some NTMs are manifestly employed as instruments of commercial policy (for example subsidies and trade defence measures), while others stem from non-trade policy objectives. The latter category comprises complex technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures, which have spread significantly. These measures are primarily implemented for legitimate and important reasons, such as food safety and environmental protection. Nevertheless, they may have considerable restrictive and distorting effects on international trade and they may be used as disguised protection of the local industry. However, elimination of such measures is generally not an option; they are here to stay.

It is challenging to implement SPS and TBT requirements that strike a balance between the protection of public health or the environment and minimizing trade costs. Where public health is concerned, we enter a scientific realm that tends to defy and supersede economics. We therefore do not enter a scientific debate over sensible levels of SPS or TBT stringency. Our focus is on the economic costs of NTMs, which needs to be weighed up with health and environmental benefits in scientific analysis.

However, NTMs affect trade not only through their inherent stringency, but also through their non-harmonization,[2] implementation and procedures. A number of regional agreements have attempted to go beyond WTO disciplines with so-called “WTO+” clauses intended to streamline regulations and strengthen regulatory coherence. With regard to NTMs, regional initiatives can be a more flexible tool than multilateral negotiations to achieve mutually beneficial "deep" economic integration.

The depth of NTM commitments in regional agreements, particularly regarding SPS and TBT, depends on several factors. One is the partners’ relative income levels, as harmonization and mutual recognition of conformity assessment results tend to be easier at similar levels of development. Another is the agreements’ overall integration depth. Customs unions and common markets go more easily than free trade agreements beyond WTO commitments. A third factor, which relates to the first two, is the prior degree of similarity between regulatory approaches, as harmonization or mutual recognition is much easier when regulations are ex ante similar.

This paper starts off with an innovative, yet simple approach of addressing this third factor. The regulatory distance measures proposed in section 2 can serve to assess the starting point and "the shortest way" for regulatory integration in regional trade agreements (RTAs). Subsequently, it could benchmark progress across sectors or for combinations of countries. Section 2 explains the methodologies used to assess regulatory distance and tests whether RTAs do indeed have an impact in promoting regulatory convergence.

Beyond such practical approaches, however, the political reality has shown that "deep" integration and harmonization processes are long drawn-out and resource-intensive. They require steadfast commitment

[2] On this, see, for example, Moenius (2004), Amurgo-Pacheco (2006), Chen and Mattoo (2008), Czubala et al. (2009), Reyes (2011, 2012) or Disdier et al. (2014).

throughout to deal with complex political decisions. The European Union and the Association of South-East Asian Nations are showcases for such experiences. Progress in streamlining NTMs in these regions has come from a mixture of outlawing certain measures for some and following the mutual recognition principle for others. In developing country regions such as the Southern African Development Community or the Common Market for Eastern and Southern Africa, similar commitments have been made, but enforcement strongly depends on members' commitment and willingness. If such a set-up collides with a perception of facilitating domestic import requirements that carries negative connotations to do with "opening markets to competitors" and "liberalization", regional integration falters.

To provide policymakers with more evidence about the benefits of addressing and streamlining NTMs, section 3.1 of this paper seeks to quantify the costs of NTMs. We use a "price gap" method based on trade unit values to estimate the ad valorem equivalents (AVEs) of goods through NTMs. In section 3.2, we attempt to bridge the gap between average NTM AVEs and a more concrete, disaggregated "flagging" of specific product markets and NTMs. We further explore the implications of high residuals from the AVE estimation, which indicate above average price impacts of NTMs and market structures. We also derive anecdotal corollaries regarding who actually pays the price for barriers to trade and who may have an interest in breaking the barriers down, and who does not.

Section 4 then goes towards more aggregation and combines our AVE estimates with household survey data to calculate the welfare impact of NTMs at the country level. This delivers highly relevant inputs for national policymakers who seek to understand the actual effect of domestic trade policy on their constituents, the general public. Such estimates are more tangible than AVEs and translate the results into policy variables that are more relevant in the context of developing countries' greater policy objectives.

Section 5 concludes with an overview of data collection, further research and the practical uses of the methods proposed in this paper.

2. REGULATORY DISTANCE OF NON-TARIFF MEASURES REGIMES

Measuring the similarity of regulations is the subject of the present section. We propose a novel conceptual approach and a formal empirical implementation based on the UNCTAD-Trade Analysis and Information System (TRAINS) NTM database.

We propose a two-way categorization of regulatory distance. At a basic level, which we will call the “distance in regulatory structure”, we measure whether or not a regulation of the same type – as per the UNCTAD-Multi-Agency Support Team (MAST) nomenclature – is applied by two different countries to the same product. At a more fine-grained level, which we call the “distance in regulatory stringency”, we look at the relative stringency of comparable NTMs; for instance, differences in labelling regulations or maximum residue limits (MRLs) applied to the same product in different countries. The first measure can be calculated directly from the UNCTAD-TRAINS NTM data. The second requires analysis based on full-text regulations, which can also be found through the database. Examples of both are provided below.

2.1 DISTANCE IN REGULATORY STRUCTURE

We measure the distance in regulatory structure as the difference between the patterns in which two countries impose NTMs, classified according to the UNCTAD-MAST nomenclature, across products. Basically, we look at whether two countries apply the same NTM types to the same products. We proceed in two steps.

Step 1. Suppose that country *i* imposes NTM B840 (TBT inspection requirements) on product HS 840731 (spark ignition reciprocating piston engines of a kind used for the propulsion of vehicles of Ch.87, of a cylinder capacity not >50cc). If country *j* also imposes B840 on HS840731, we say that, for the given measure-product pair, countries *i* and *j* have a “similar” regulatory structure and code our regulatory distance variable as zero. If, by contrast, country *j* does not impose B840 on that product but imposes either no NTM or instead, say, B810 (product registration requirements), we say *i* and *j* are "different" for that measure-product pair and code the regulatory distance variable as one. Formally, let *i* index countries, *k* HS6 products and *j* NTM types, and let

$$n_{i\ell k} = \begin{cases} 1 & \text{if country } i \text{ applies NTM } \ell \text{ to product } k \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

be a "dummy" (binary) variable marking the application of NTM type ℓ by country *i* on product *k*. The regulatory distance measure at the measure-product level is then $RD_{\ell k} = \left| n_{i\ell k} - n_{j\ell k} \right|$.

Step 2. Then, we aggregate our regulatory distance variable over all measures and all products (several thousand cells) to get an overall measure of dissimilarity. Formalizing again our definition, let *N* be the total number of observed product-NTM combinations. The distance in regulatory structures between countries *i* and *j*, D_{ij} is

$$D_{ij} = \frac{1}{N} \sum_k \sum_\ell \left| n_{i\ell k} - n_{j\ell k} \right| \tag{2}$$

that is, the sum of the absolute values of the differences in NTM application status. As the individual terms $RD_{\ell k}$ are either zero (when a given NTM is applied by both *i* and *j* to the same product) or one (when one of the two countries applies a measure that the other does not to a given product), it does not matter which distance concept we use (e.g. Euclidean or Manhattan).

Because regulatory distance is normalized by the grand total of product-NTM combinations, it lies between zero and one and is typically a small number. In our sample, it ranges from 0.009 between Madagascar and the United Republic of Tanzania and 0.304 between China and Nepal.

The approach is highly flexible. The regulatory distance can easily be disaggregated to a product or sector level. Comparisons can be made between two or more countries, or entire PTAs or regional groups can be benchmarked against each other. The assessment can also focus on specific groups of NTMs only.

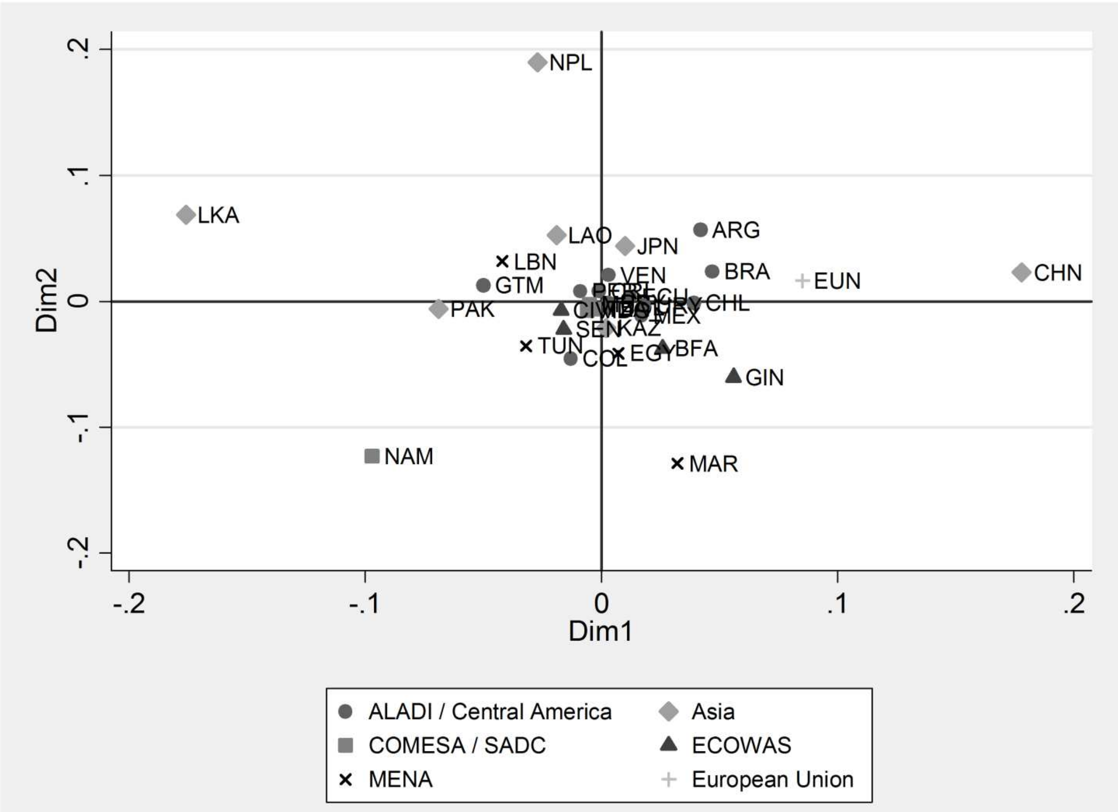
Large tables can be unwieldy to use, so figure 1 shows a new and alternative way of representing regulatory distance. The idea is to project bilateral distances onto a plane akin to a map. Mathematical details of the method are given in the appendix. Clearly, the mapping cannot be perfect; with 33 countries to place on the map (we treat the European Union as one, as the regulatory distance among member States is zero) and arbitrary distances between them, only a 32-dimensional space could provide a perfect representation. As the number of dimensions shrinks, the distortion in the representation of distances grows. The distortion for a two-dimensional projection is shown in appendix figure A1. If there was no distortion, all points would lie on the 45° line; it can be seen that the distortion remains moderate.

We show the resulting projection on a two-dimensional space in figure 1. In order to interpret the figure, note that the axes are arbitrary: they are scaled so as to fit the range of bilateral distances and merely represent the cardinal points in which distances are mapped. Figure 1, which shows the results for the overall NTM database, suggests several observations.

First, there is a "core" of countries with similar NTM patterns at the product level, providing a sort of common pattern of NTM regimes. It is remarkable how consistently close Latin American countries turn out to be. The two big economies of the Southern Common Market (MERCOSUR), Argentina (ARG) and Brazil (BRA), which are known for their more regulated markets, do indeed stand out the most from the group.

Second, a small number of countries stand out for unusual patterns of NTM imposition. These include Nepal (NPL in figure 1), Sri Lanka (LKA), China (CHN), Morocco (MAR), and Namibia (NAM).[3] It should be noted in this context that UNCTAD is aware of data quality issues for these countries, which may be a strong reason for the outlier positions. By contrast, data for Latin America (along with data for the European Union and newly collected data for West African countries) are considered good quality data. In this regard, the proposed methodology can also serve as part of data quality checking procedures. Data issues notwithstanding, Morocco's position as an outlier is particularly striking, suggesting that the process of regulatory harmonization envisaged by the Morocco-European Union Association Agreement under the Euro-Mediterranean Partnership framework and stated in its Article 51 is still far from completion even at the relatively crude level of the regulatory structure.

Figure 1: Two-dimensional representation of distance in regulatory structures



Notes: Kruskal stress value 0.208; ECOWAS: Economic Community of West African States; MENA: Middle East & North Africa; COMESA: Common Market for Eastern and Southern Africa; SADC: Southern Africa Development Community. Country codes refer to ISO alpha-3 codes, available at: http://unstats.un.org/unsd/tradekb/Knowledgebase/Country-Code

Source: Authors' calculations based on UNCTAD-TRAINS NTM database.

In order to dig deeper into distances in regulatory structures, Figure 2 limits the sample to agrifood products (Harmonized System chapters 01 to 24) and SPS measures. The result is markedly different, with more dispersion overall (there is no "core" anymore).

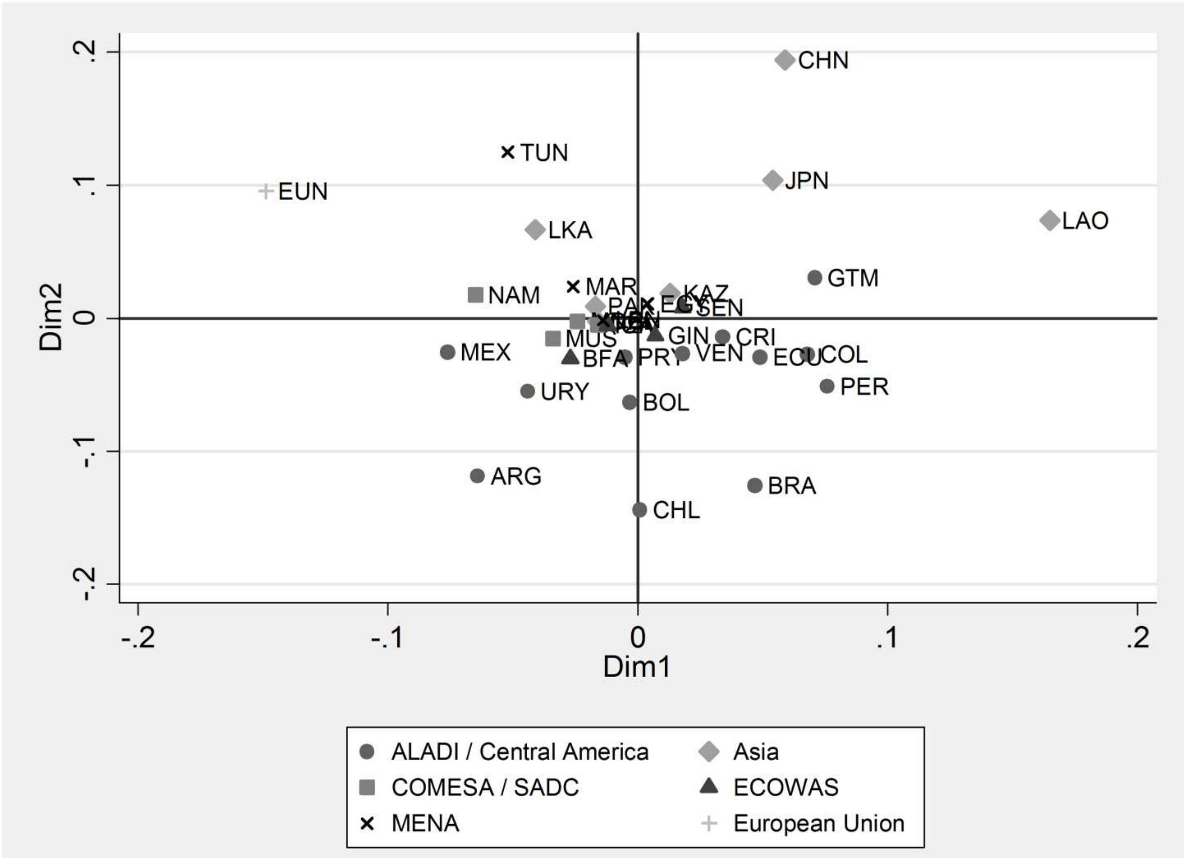
The European Union (EUN in the figure) now appears as an outlier. Morocco's harmonization of many SPS measures with the European Union (see Augier et al., 2013) shows up as a lesser regulatory distance in figure 2 (163 per cent of the average bilateral distance in the sample) than in figure 1 (190 per cent of the average bilateral distance). Tunisia (TUN), which also harmonized a large number of measures with the

[3] We recoded Chinese data to transform all NTMs erroneously coded as B for products other than agrifood products (Harmonized System chapters HS01 to HS24) into A, keeping the last 3 digits the same.

European Union as part of the Euro-Mediterranean Partnership agreements, appears as relatively close to the European Union in figure 2.

An intuitive explanation for the generally strong regulatory dispersion is that agricultural markets are highly sensitive and their regulation is often subject to strong domestic lobbies. Political economy literature has long discussed the endogeneity of trade protection and lobbying.[4] In this case, domestic production structures would be a determinant of SPS policies, causing the regulatory distance to increase. In this light, the regulatory distance analysis of NTM data would be further evidence that, despite such WTO provisions, SPS measures diverge from a scientific justification and are actually misused for protectionist objectives.

Figure 2: Two-dimensional representation of distance in regulatory structures, agri-food products and SPS measures only



Notes: Chapters HS01-24 only; Kruskal stress value 0.224.

Source: Authors' calculations based on UNCTAD-TRAINS NTM database.

Our way of representing regulatory distances has several potential uses.

First, it can be used to assess and benchmark the effectiveness of regional trade agreements (RTAs) in fostering regulatory convergence. The case of Morocco, discussed above, suggests that harmonization clauses in regional agreements may not be enough to trigger substantial migration of regulatory systems. The regulatory distance may also serve in identifying of priority sectors or countries in RTAs where integration is lagging, and "best practice" sectors or country pairs where integration is advanced.

[4] For classic examples of this literature regarding trade policy and NTMs, see Trefler (1993), Lee and Swagel (1997), Grossman and Helpman (1994), Goldberg and Maggi (1999) and a brief overview of this literature in Knebel (2010).

As a further step, we regressed our regulatory distance measure on a dummy variable equal to one when both countries belong to one of the RTAs identified by Piermartini and Budetta (2009) and reproduced in appendix table A1. Results are shown in table 1.

Table 1: Regression results, distance in regulatory structures and RTAs

	(1)	(2)
Both in the same RTA (any)	-0.033 (8.07)***	
Both in ALADI		-0.029 (2.83)***
Both in Andean Community		-0.023 (0.77)
Both in Central American Common Market		-0.049 (0.72)
Both in COMESA		-0.033 (0.85)
Both in SADC		-0.045 (1.14)
Both in SAFTA		0.018 (0.46
Constant	0.086 (24.33)***	0.083 (26.15)***
Observations	992	991
R-squared	0.01	0.01

Estimator: OLS; dependent variable: bilateral regulatory distance
Robust t-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

The coefficient in the first column of table 1 is negative and highly statistically significant (at the 1% level), suggesting that, on average, the RTAs overlapping with the UNCTAD-TRAINS NTM database reduce regulatory distance between their members. The effect is quantitatively very large: the average regulatory distance between country pairs in our sample is 0.079. Thus, the average RTA cuts distance in regulatory structures by 0.033/0.079 = 41%. The second column breaks down this effect by individual agreement. The estimated effect for the Latin American Integration Association (ALADI) is also negative and highly significant. For other agreements, we do not have enough observations to estimate statistically significant effects, but it should be noted that they are all negative except for the South Asian Free Trade Area (SAFTA). Clearly, more research and updated data is needed to assess whether these results are confirmed on a larger sample and with adequate controls; but the prima facie results are encouraging. From a policy perspective, they suggest that RTAs induce a convergence of regulatory structures; that is, member States tend to apply the same type of measures to the same products. This should greatly facilitate further in-depth harmonization within measure types, that is, convergence in the level of stringency of the measures. But even prior to such convergence, it makes regulatory systems more “readable” for exporters within the region.

2.2 DISTANCE IN REGULATORY STRINGENCY

The distance in regulatory structure evaluates patterns of NTMs at the level of detail that is defined by the UNCTAD-MAST nomenclature, which defines 122 different codes, of which 33 are distinct types of SPS measures. While this represents a high degree of disaggregation, the reality of NTMs is even more complex. The distance in regulatory stringency explores differences between NTMs even within the same NTM code. This requires a case study analysis of full-text regulations. The UNCTAD-TRAINS database gives detailed information about the regulations in which NTMs are specified and thus provides an easy access point for the connection between regulatory structures and regulatory stringency. UNCTAD has, furthermore, started to store the full-text regulations in a repository with a view to including these in the database.

Comparing the distance in regulatory stringency requires different approaches for different measures. In many cases, the evaluation is entirely qualitative, while in other instances, quantitative approaches can be used. Two examples are provided below: the first employs quantitative techniques for the analysis of tolerance limits for residues of or contamination by certain non-microbiological substances such as pesticides; the second relies on a qualitative comparison between labelling requirements in selected Latin American countries.

2.2.1 Quantitative comparison of maximum residue limits

In this example we look at MRLs (NTM code A21), which allow for a more quantitative analysis as the limits for chemical substances have numeric values which are comparable across countries. We look at the requirements applied by Argentina, Brazil, Chile and Colombia to the imports of oranges (HS 080510): for oranges, Argentina imposes MRLs on 79 different chemicals, Brazil on 101, Chile on 110 and Colombia on 72.[5] The Codex Alimentarius, as an international impartial reference, lists 83 chemicals.[6] Using the data, one can calculate a first measure of the distance in regulatory stringency defined by equation (3), which expresses whether countries regulate the same chemicals, or different ones. That is, let

$$n_{ip} = \begin{cases} 1 & \text{if country } i \text{ applies and MRL to pesticide } k \text{ for oranges} \\ 0 & \text{otherwise} \end{cases} \qquad (3)$$

and let

$$D_{ij,\text{oranges}} = \frac{1}{N_p} \sum\nolimits_p \left| n_{ip} - n_{jp} \right|$$

where N_p is the number of pesticides potentially applied on oranges (here 213).

The results are expressed on the horizontal axis of figure 3 (similar MRLs towards the left; different ones towards the right). In this dimension, Argentina and Colombia are farthest apart, as they tend to impose residue limits on oranges for rather different sets of chemicals. Colombia's MRLs are rather similar to those of Brazil and Chile. Furthermore, Colombia applies MRLs to a very similar set of chemicals as proposed by the Codex Alimentarius, which can be interpreted as an international best practice.

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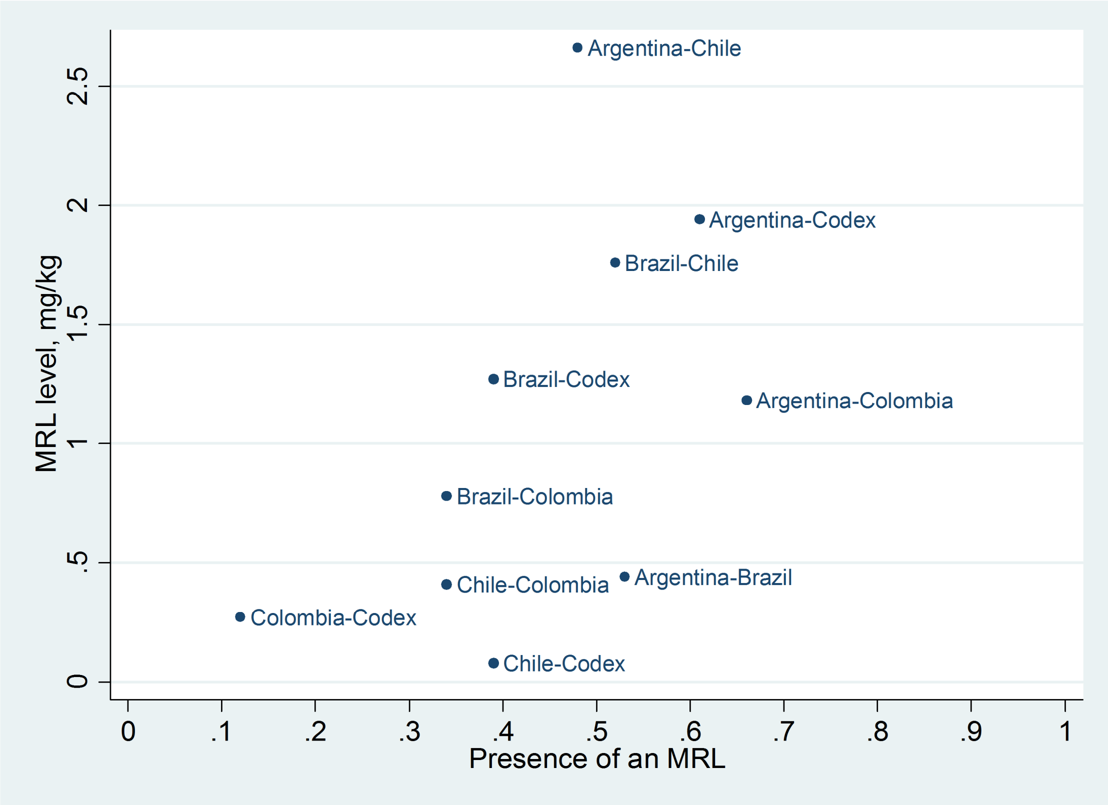
5 Data come from the United States Department of Agriculture (USDA) Foreign Agricultural Service, which maintains a restricted-access International Maximum Residue Limit Database. See <http://login.mrldatabase.com>. Similar information should also be extractable through accessing full-text regulations in the UNCTAD database.

6 While the USDA database lists 83 substances, the Codex home page lists only 10 MRLs for pesticides on foods and feeds under category FC0004, "oranges, sweet, sour (including orange-like hybrids): several cultivars". See <http://www.codexalimentarius.net/pestres/data/commodities/details.html?id=127>.

Figure 3: Correlation of the two measures of distance in regulatory stringency



Note: Distances on the vertical axis do not lie between zero and one as they are averages of the absolute values of differences between MRLs expressed in mg/kg.

Source: Authors' calculations using the International Maximum Residue Limit Database of the United States Department of Agriculture.

Taking advantage of the fact that MRLs are all expressed in a homogeneous metric (mg per kg), one can push the logic of distance in regulatory stringency one step further and assess regulatory distance in terms of the specific requirement for each chemical substance. That is, let x_{ip} be the MRL of pesticide *p* imposed on oranges by country *i*, in mg per kg. Then

$$\tilde{D}_{ij,\text{oranges}} = \frac{1}{N_p} \sum_p \left| x_{ip} - x_{jp} \right| . \qquad (4)$$

Note that when a country imposes no MRL for a given pesticide, the database codes it as a missing value. Thus, x_{ip} is undefined and pesticide *p* drops out of the sample when taking the differences in (4), which include only cases where *i* and *j* impose MRLs on the same pesticide. Cases where one of the two imposes an MRL and the other does not are picked up by (4).

The results of this second dimension are illustrated on the vertical axis of figure 3 (similar MRLs towards the bottom; different ones towards the top). The smallest distance is between Chile and the Codex Alimentarius, reflecting the active adoption by Chile of many standards based on the Codex. Bilaterally, the smallest distance is between Chile and Colombia, followed closely by Argentina and Brazil.

Figure 3 as a whole now depicts the distance in regulatory stringency for MRLs on oranges in both dimensions; the similarity of actual regulated substances (horizontal axis) and the level of stringency regarding those substances (vertical axis). Towards the bottom left, one could say that MRL regulations converge, whereas towards the top right they diverge.

It is also interesting, as the cases of Chile and Colombia illustrate, to apply the regulatory distance concept to benchmark country practices relative to international standards. It should be noted, though, that the adoption of international standards may raise complex issues for low-income countries (see Keyser, 2001).

2.2.2 Qualitative comparison of labelling requirements

Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia and Uruguay all apply labelling requirements for goods intended for human consumption. Generally, these regulations tend to follow a similar structure: they provide requirements on language, size and detailed specifications for the elements printed on the label depending on the types of food products. But they differ in detail, such as the required wording related to product expiry dates. The Uruguayan regulation[7] just specifies the format of the expiry date that has to be printed on the label, whereas Bolivian legislation[8] prescribes specific wording and expressions for the expiry date.

Regulations also vary in such detail as font size of the labelling. Brazilian[9] and Argentine[10] regulations reflect the harmonized technical regulations on labelling in MERCOSUR.[11] Mandatory information on the label must be printed in fonts larger than one millimetre. In the Plurinational State of Bolivia, the regulation is similar,[12] with one amendment for very small packages for which only net content and sanitary registration need to be included, and "the rest of the information will be declared in package containing several units of the product".[13] In the case of the Chilean regulation, "the font of the expiration date cannot be less than 2mm",[14] and "net content font will be equal or greater than 1/36 of the height of the label".[15] Colombian requirements are worth mentioning as they adopt rather stringent labelling requirements from the United States of America and the European Union.[16] Besides stipulating that comparatively large font sizes be used, the list of rules regarding information about nutritional content is extensive.

While most of these differences appear negligible, they may create unexpected and largely unnecessary frictions in regional trade, especially for small and medium-sized enterprises. The harmonization among MERCOSUR members can serve as a building block to facilitate wider harmonization in the region.

It should have become clear that this type of analysis regarding the distance in regulatory stringency is very complex. To keep comparisons feasible, we can only pick one product at a time and compare a particular NTM type for a limited number of countries. The analysis can be time-consuming and needs to be adapted to the particular type of NTM, ranging from qualitative to more quantitative approaches. Nevertheless, the results are highly relevant and worthwhile. Therefore, the challenge is to select the most pertinent product-NTM-country combinations for such case studies. Starting from the distance in regulatory structure, we can narrow down the selection of cases substantially. Another complementary method is presented in section 3.2 of this paper. After that, regional priority sectors, value chain analysis and private-sector views should help to identify the key products that need to be looked at.

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[7] Decree 141 of April 1992; modified by decree 231/06, Article 1

[8] Idem. Article 4.

[9] Administrative Resolution 259 of 20/IX/02. RDC. Modified by resolution 123/04 RDC/ANVISA, Article 8

[10] Administrative Resolution 146 of 12/X/04. Ministry of Economy and Production. Approved resolution GMC 26/03, Article 8.

[11] Idem. Article 8.

[12] Bolivian Norm 314 001 of 14/08/01. Bolivian Institute of Normalization and Quality. Article 5.

[13] Idem.

[14] Decree 297 of 3/VI/92. Modified by decree 682 of 19/XI/93. Article 19.

[15] Idem. Article 20.

[16] Administrative Resolution 005109 of 29/XII/2005. Ministry of Social Protection. Technical Annex; and Administrative Resolution 333 of 10/II/11. Ministry of Social Protection. Article 26.

3. MEASURING THE IMPACT OF NTMS

We now turn to the measurement of the restrictiveness of NTMs. Whether harmonized or not, NTMs generate compliance costs. If, say, electric wiring must satisfy particular fireproofing requirements, more expensive materials will need to be substituted for cheaper ones. If vegetable production must satisfy stringent regulations with regard to maximum residual levels of certain pesticides, more expensive production methods that leave no trace of such pesticides will have to be used. These costs will be passed on to consumers – although the degree of pass-through depends on many observed and unobserved producer and market characteristics – and ought to be measured.

There are two ways of looking at this effect: through prices or through quantities. When a country imposes a cost-raising NTM on a certain good, the price of that good on the domestic market will rise. If the regulatory measures are non-discriminatory as mandated by WTO rules, the price rise reflects a cost increase that is the same for imported and domestically-produced brands of the good. The price rise, in turn, reduces demand for both imported and domestically-produced brands. Thus, there are conceptually two ways of approaching the demand-reducing effect of the measures: (i) by looking at the price increase, or (ii) by looking at the reduction in the quantity demanded. In the following section we propose a price-based method that directly estimates AVEs from NTM and trade unit value data.

3.1 A PRICE-BASED METHOD TO ESTIMATE AD VALOREM EQUIVALENTS

The estimation strategy we propose for price-based estimation can be thought of as a simple treatment-effect approach where the prices of some goods in some countries are “treated” by NTMs.

The basic issue with price-based estimation is that domestic price data are not published systematically. National statistical institutes collect detailed price data for the calculation of consumer price indices, but the classification varies across countries and true price data, considered sensitive, is typically not made available: only price *indices*, normalized by a base year, are made public. Those indices are comparable over time but not across countries; thus they cannot be used for our purposes since we have only one year of NTM data and can infer their effect only through cross-country comparisons.

The only type of prices observable in absolute form and at a disaggregated level is trade unit values, obtained by dividing trade values by quantities. There are several problems with using trade unit values to assess the price-raising effect of NTMs. One is that the data are noisy, as customs authorities typically monitor import quantities imperfectly (border taxes are assessed on values, not quantities). However, even noisy data does not represent a fundamental problem for this econometric estimation as long as measurement errors are uncorrelated with other regressors on the right-hand side. Furthermore, we use a trade unit value dataset created by Berthou and Emlinger (2011) that mitigates noise and certain biases. The second problem is that trade unit values do not include intermediation margins (from cost-insurance-freight border price to wholesale and retail prices). This is problematic in the presence of quantitative restrictions, if licences are given to domestic distributors; in that case, trade unit values will not reflect the shadow value of the licences. For our purposes, however, this is not a major problem as most quantitative restrictions have been eliminated following the termination of the Agreement on Textiles and Clothing in December 2004. For regulations whose effect is to raise production costs, compliance costs will be reflected in producer prices and therefore in trade unit values. This potential problem should, however, be kept in mind when interpreting the price effect of NTMs other than in MAST categories A (SPS) and B (TBT).

Formally, let o, d and p index, respectively, the origin country, the destination country and a product identified at the six-digit level of the Harmonized System (HS6), at which there are over 5,000 products. Let δ_o and δ_d designate vectors of “fixed effects” identifying each origin country and each destination country, respectively. These fixed effects adjust the model’s constant for each country, neutralizing the influence of all idiosyncratic factors that could influence the level of prices (for the destination country, they control for the cost of living; for the origin country, they control for aggregate productivity). Let v_{odp} be the unit value of product *p* imported from country *o* to country *d*, t_{odp} be the tariff imposed by destination country *d* on product *p* from origin *o*, and $\mathbf{x}_{od}$ a vector of bilateral determinants of trade, including distance, common language, common border, and so on. Let A designate type-A measures (SPS) in the MAST nomenclature, "B" type-B measures (TBT) and "other" lump together all the rest (quantitative restrictions, prices measures and the like). Let also

$$n_{dp}^{A} = \begin{cases} 1 & \text{if country } d \text{ applies a type-A NTM to product } p \\ 0 & \text{otherwise} \end{cases} \tag{5}$$

The estimation equation is

$$\ln v_{odp} = \delta_o + \delta_d + \beta_1^A n_{dp}^A + \beta_1^B n_{dp}^B + \beta_1^{other} n_{dp}^{other} + \beta_2 \ln\left(1 + t_{odp}\right) + \mathbf{x}_{od}\boldsymbol{\gamma} + u_{odp} \tag{6}$$

Note the similarity of (6) to a standard gravity equation of trade. A variant of this equation makes it possible to differentiate the effect of NTMs depending on characteristics of the importing country by interacting country characteristics such as the level of income with the presence of NTMs:

$$\ln v_{odp} = \delta_o + \delta_d + \sum_{k=A,B,\text{other}} \beta_1^k n_{dp}^k + \sum_{k=A,B,\text{other}} \beta_1^k \left(n_{dp}^k \times z_d\right) + \beta_2 \ln\left(1 + t_{odp}\right) + \mathbf{x}_{od}\boldsymbol{\gamma} + u_{odp} \tag{7}$$

where z_i denotes those characteristics. Yet another version of the variant consists of interacting NTMs not with country characteristics as in (7), but with country dummies. The idea is the same – namely, to account for systematic variations between countries in the application of *all* NTMs on *all* products, depending on levels of income, governance and, when using dummies, on any unobservable characteristics of a given country.

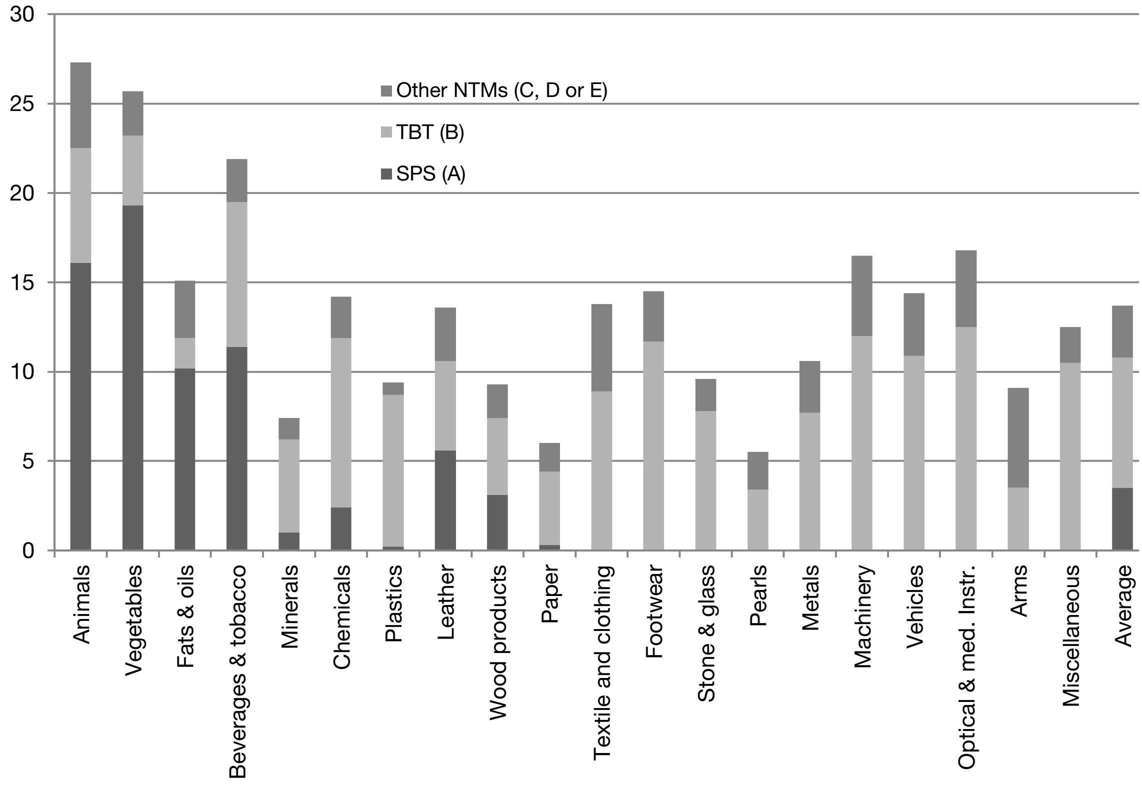
Given that there are over 4,575 products at the HS6 level on which at least one country in our sample has an NTM (in all, there are over 5,000 products at HS6); three different types of NTMs (A, B and "other") and five coefficients by type of NTM (the importer-specific dummy interacted with the fives type of NTMs), the estimation in (7) would involve estimating a maximum of 3 × 5 × 4,575 = 68,625 coefficients. This is likely to be intractable if we try to estimate these coefficients in a single regression. We only show import-weighted average AVEs for each type of NTM, by country and by sector.

Note that the degree of pass-through of compliance costs is not mechanical and depends on market structure. In a standard monopolistic-competition model, "mill pricing", where producers charge the same free-on-board (fob) price to all destinations, is optimal. There is then full pass-through. However, new theoretical and empirical developments show that the degree of pass-through depends on market structure, firm size and other determinants (see e.g. Auer and Schoenle (2013) and the references therein).

Figure 4 shows average AVEs for 20 industries. As we could expect, SPS measures tend to be more constraining for food products while TBT measures are more obstructive in the equipment and machinery sectors. Other measures such as quantity controls (E) or price control measures (D) are less present nowadays, so their impact is less important.

Table A2 in the appendix shows average AVEs for 20 industries by region. We observe that quantity regulations (NTMs other than SPS or TBT) are less relevant in the European Union, where constraints from SPS and TBT measures are more significant. Also, AVEs for TBT measures are high in Africa compared with other regions, particularly in the vehicle and machinery industries as well as in the textile and footwear industries.

Figure 4: Combined AVEs (SPS + TBT + other) by sector



Source: Authors' calculations using UNCTAD-TRAINS NTM database.

In contrast to the described approach, quantity-based methods use the variation in import volumes associated with the imposition of NTMs to infer their price-raising effect, via the price elasticity of demand. This approach has been used in a much-cited paper by Kee, Nicita and Olarreaga (2009) to estimate AVEs. NTM AVEs retrieved algebraically from their estimates across products and across instruments (i.e. combined them with tariffs) are aggregated into Overall Trade Restrictiveness Indices (OTRI) by country. The country-specific dimension of these OTRI is derived from interaction terms between the NTM variable and regressors that vary across countries such as gross domestic product per capita or factor endowments, and not from more detailed information about the restrictiveness of the NTMs themselves.

Quantity-based estimations could also easily incorporate our measure of regulatory distance as an explanatory variable. A given NTM may be less inhibiting on bilateral trade between countries that have similar or harmonized NTMs than on trade between countries that have different NTMs. For instance, if a country imposes certain requirements for food containers and the exporting country imposes the same requirements on its domestic producers, the requirement will be less trade-inhibiting. The reason for this is subtle: the price effect is the same (complying with the regulation requires the use of expensive materials and precautions in the manufacturing); consequently, the demand-reducing effect in the importing country is also the same. However, the similarity of the regulations may induce trade diversion away from other partners that have different types of regulations, which would make them trade more bilaterally. This type of effect has been explored in the context of aggregate trade but only using treaty-based proxies for NTM harmonization.[17] Regulatory distance provides a more direct measure of the similarity of regulatory regimes; moreover, the issue has not been explored at the product level on the basis of the UNCTAD-TRAINS NTM database.

Both price-based and quantity-based estimations have strengths and weaknesses, and they should be seen as complementary approaches to the problem of estimating the effect of NTMs on trade flows. In

[17] See, inter alia, Chen and Mattoo (2008) or Disdier et al. (2014)

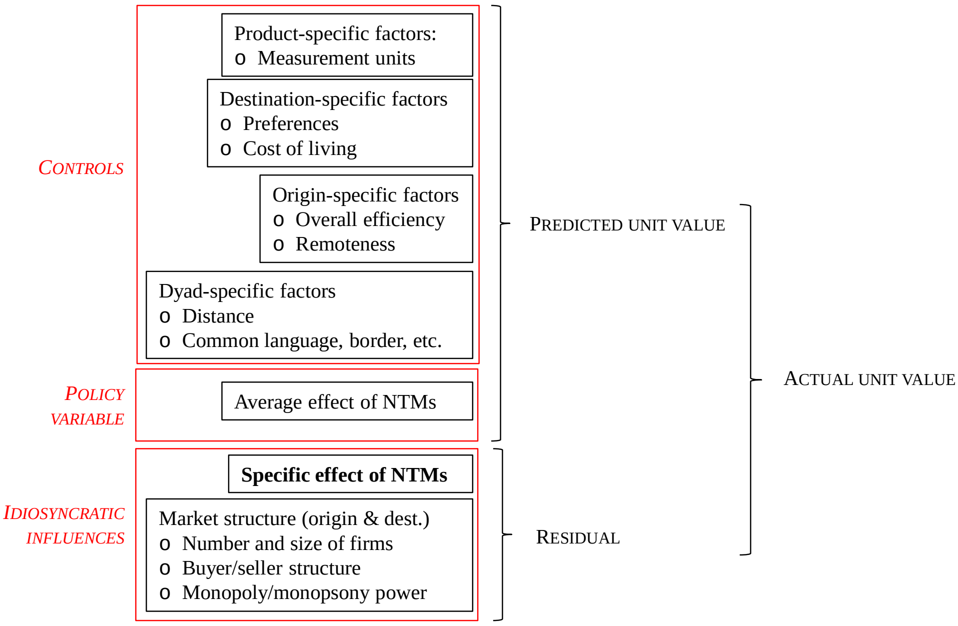
both cases, effects are average effects rather than country-specific. They are indispensable in generating in a reliable way the "big numbers" that can indicate whether or not NTMs have massive effects on world trade, and in differentiating effects between measures (e.g. to estimate whether SPS measures have, on average, larger effects on trade than TBT measures). But even when interaction terms with country-specific characteristics are included in the regressions, they should not be expected to help to identify problem cases at the country-product level for policy advice. This has been and remains a considerable source of confusion in the interpretation of estimates. If case-specific estimates are required, a different method, discussed in the next section, may be used.

3.2 FROM MEASUREMENT TO POLICY ADVICE: IDENTIFYING AND FLAGGING PROBLEM CASES

Econometric estimates are generally of limited use to flag problem cases at the country-product level; yet, beyond "big numbers" such as welfare and employment effects, this is what policymakers are ultimately interested in. We now turn to an approach capable of filling the missing link between big numbers and policy advice on the ground. The approach can support the identification of priority areas in bilateral and regional trade negotiations, and, perhaps more importantly, in unilateral efforts to streamline NTMs. A concrete example below also shows the need for a systemic approach to address NTMs beyond identifying and addressing single cases.

Our proposed approach draws on price-based estimation, although it could possibly be extended to quantity-based estimation. Intuitively, it is a generalization of the well-known "price gap" method recommended by an attachment to annex 5 of the WTO Agreement on Agriculture. We use econometric estimation to decompose observed unit values into (i) a fraction that is explained by control variables (including tariffs) and the average effect of our policy variable (the imposition of NTMs); and (ii) a fraction that is driven by unobserved effects at the country-product level. This is where excessively high costs of compliance with particular NTMs would be reflected, which are sometimes referred to as non-tariff *barriers* (NTBs). Certain market structures, such as monopolistic or oligopolistic supply, can also cause a high residual at the country-product level. The decomposition is shown in figure 5.

Figure 5: Decomposition of the variation in unit values across products and country pairs

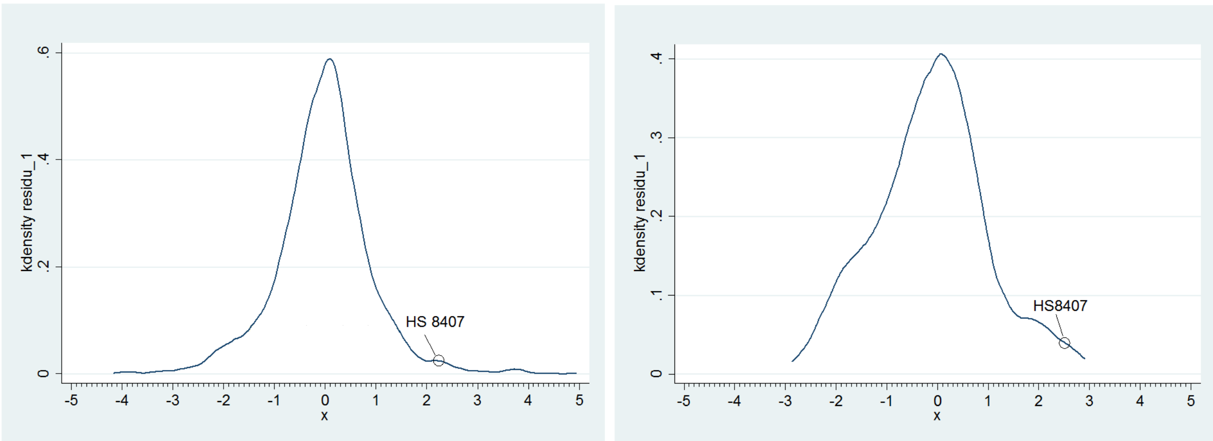


Formally, let e_{odp} designate residuals from equation (6), and let $f^{d}\left(e_{odp}\right)$ be their distribution for destination (importing) country *d*. Our indicator to identify excessive costs of compliance with NTMs is the position of e_{odp} in the distribution of residuals for country *d*, $f^d\left(e_{odp}\right)$. We propose to match evidence on the ground with econometric evidence of "unusually high" unit values, once those have been purged out of all observable influences as shown in figure 5.

For instance, in Kenya, according to the UNCTAD-TRAINS NTM database, products in HS 8407 (internal combustion engines) are affected by product registration requirements (B810), testing requirements (B820), certification of conformity (B830), inspection requirements (B840) and traceability information requirements (B850).[18] The list in itself suggests a heavy requirement, which should push predicted unit values for those products to a relatively high level if compliance costs are, on average across countries, substantial for each of those requirements. Thus, in terms of figure 5, the upper part (the predicted value) can be expected to be high. But as it turns out, our estimation suggests that the lower part (the residual) is high as well. Figure 6 shows their collective position in the distribution of residuals for Kenya's imports. It can be seen that they are in the upper part of the distribution, where only few products remain.

Figure 6: Distribution of unit-value residuals for Kenya and relative position of HS 8407

a) all importers *b) imports from the United Republic of Tanzania*



Source: authors' calculations using the UNCTAD-TRAINS NTM database.

If one further breaks down the distribution of unit-value residuals for Kenya's imports from the United Republic of Tanzania, the position of HS 8407 is even more extreme when compared with other imports from the United Republic of Tanzania.

Does this seem to fit the reality on the ground? The Tripartite of the Southern African Development Community, the Common Market for Eastern and Southern Africa and the East African Community runs a portal where the private sector can lodge complaints about burdensome policies or procedures, which they call NTBs. Indeed, the portal reports complaints from the United Republic of Tanzania about Kenya's lack of recognition of the East African Community rules of origin for motor engines imported from the United Republic of Tanzania, Uganda and Rwanda. This pushes up prices in Kenya, protecting Kenyan traders of those products, and pushing up trade unit values as regional traders align their prices on the high prices prevailing in Kenya.

This, incidentally, highlights a potentially important policy issue. If the increase in trade unit values reflects not only the pass-through of compliance costs, but also additional monopoly power. our analysis suggests that the monopoly rents created by Kenya's NTB in engines may be partly appropriated by exporters from exporting countries (the United Republic of Tanzania here). This may help to explain the lack of progress in regional negotiations to eliminate NTBs: if exporters have their cut in the "protectionist loot",

[18] This specific product is also covered by other NTMs less concerned by the recognition of rules of origin, such as export license (E400), product quality or performance requirement (B700), authorization requirement for TBT reasons (B140), pre-shipment inspection (C100) and import monitoring and surveillance requirements (C400).

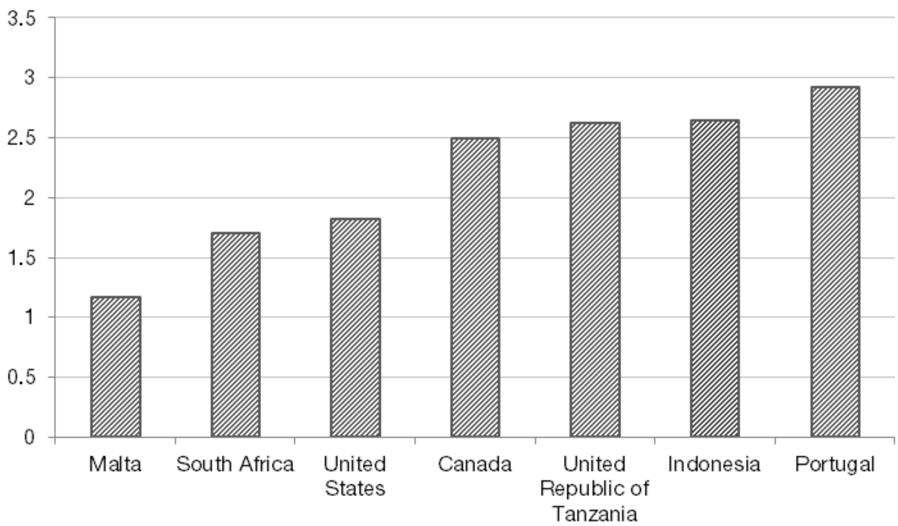
their governments will not push very forcefully for their elimination at the negotiating table. Who are the real losers then? They are not Kenya’s trading partners. They are the downstream buyers of engines *in Kenya*, Kenya's infant car industry, and finally consumers.

Thus, the elimination of NTBs should not be construed by the Kenyan Government as a concession to its trading partners: it should be considered as part of a pro-competitive industrialization agenda. Our quantitative analysis based on the decomposition of unit-value variation shows why systematic NTM streamlining as part of national “better-regulations” agendas is an important complement to the “identify-negotiate-eliminate” approach at the regional level.

Moreover, Kenya’s reported NTBs on the import of engines do not seem to affect only the United Republic of Tanzania. Figure 7 shows that unit-value residuals are even higher on engine imports from Indonesia and Portugal. Thus, more than the non-recognition of certificates of origin is likely to be at play; it is likely that other procedural obstacles in Kenya lead to such high unit-value residuals. Moreover, figure 7 shows that where NTBs affect several trading partners, their elimination would be a public good for which it is unlikely that a working coalition can be built (as the stakes are low for Indonesia and Portugal). This indicates that the “trade-negotiations” approach to NTB elimination, in particular on a case-by-case basis, may not always be successful. It needs to be complimented by domestic regulatory-improvement agendas as well as systematic approaches to address NTMs at the regional or, preferably, multilateral level.

We used the case of engines in Kenya as an illustration of the back-and-forth between systematic econometric analysis and case-study analysis on the ground. We believe this approach can deliver substantial progress in understanding the trade effects of NTMs. Econometric analysis *alone* is unlikely to yield a systematic way of identifying intentional or unintentional *barriers* among NTMs; fact-finding, verification and understanding of the facts on the ground are indispensable in understanding what special interests are at stake and what lobbying line-up has produced the observed policy distortion. Likewise, case studies and storytelling are unlikely, by themselves, to provide sufficient evidence to be raised in policy dialogue, because complaints, by themselves, are riddled with disinformation and distorted facts. Thus, econometric analysis and case studies should be used jointly as reality checks on one another to provide a rich yet rigorous picture of regulatory distortions.

Figure 7: Kenya’s unit-value residual for HS 8407 by origin of imports (as standard deviations)



Source: authors’ calculations using the UNCTAD-TRAINS NTM database.

4. IDENTIFYING AND SIMULATING POVERTY AND EFFICIENCY EFFECTS

So far, our discussion of the effect of NTMs has been confined to their direct trade and price effects. While these are an essential input for further analysis, policymakers are typically interested in trade performance only as a vehicle for higher-level objectives such as employment or poverty reduction. In order to provide a useful input in policy discussions, the effect of NTMs should be analysed in this broader context, requiring different tools of analysis.

Notwithstanding their benefits, NTMs contribute to raising the cost of living for consumers in the country imposing them and may thus have effects that are felt unequally along the income distribution. The question that naturally arises is whether or not they are regressive (hitting the poor disproportionately). In order to explore this question, estimated AVEs of NTMs can be combined with household-survey data in order to assess the contribution of each product-measure pair on household expenditure. When the price of a good rises, under the effect of an NTM or any other price-raising shock, consumers switch away from that good toward cheaper ones. Thus, an NTM that raises the price of a given product by, say, 10 per cent, will not raise consumer expenditure by as much. In the analysis that follows, we abstract from expenditure-switching effects of this type and consider only "first-order" (direct) effects.

The method goes as follows. Let ω_{ph} be the weight of product *p* in the expenditure of household *h*. The total effect of NTMs on the cost of living of household *h* is

$$\Delta E_h = \sum\nolimits_p \omega_{ph} AVE_p \tag{8}$$

For instance, suppose that there are only two NTMs in force, say SPS measures, one on a product representing 20 per cent of household *h*'s expenditure with an AVE of 10 per cent and one on a product representing 10 per cent of its expenditure with an AVE of 5 per cent. The total increase in the cost of living is then (0.2 × 0.1) + (0.1 × 0.05) = 0.025 or a rise of 2.5 per cent in household *h*'s cost of living.

The case of measures affecting crops produced by some households in the country deserves special discussion. When measuring the effect of tariffs on household real income, the correct equivalent of (8) nets out production from consumption, as tariffs tax consumption but protect production. That is, if ω_{ph}^{prod} and ω_{ph}^{cons} are the weights of product *p* in household *h*'s production and consumption respectively, (8) becomes

$$\Delta E_h = \sum\nolimits_p \left(\omega_{ph}^{cons} - \omega_{ph}^{prod} \right) AVE_p \tag{9}$$

In the case of NTMs – say SPS regulations, relevant for agricultural products – an NTM, if applied in a non-discriminatory manner, does not protect domestic production: it imposes the same compliance cost onto domestic and foreign producers. Provided that markets are reasonably competitive, as they often are in agriculture, the rise in the product's price will reflect the compliance cost. Indeed, this is the assumption on which the whole analysis of AVEs rests. Thus, the production effect nets out itself, and only the consumption effect remains, so that (8) remains correct. In the case of developing countries and where production is for domestic consumption, it is often the case that SPS regulations, when enforced at all, are enforced only at the border. In that case, the correct treatment should be the same as for tariffs, and (9) applies. Which formula is correct is a matter of judgment given the particulars of the situation analysed.

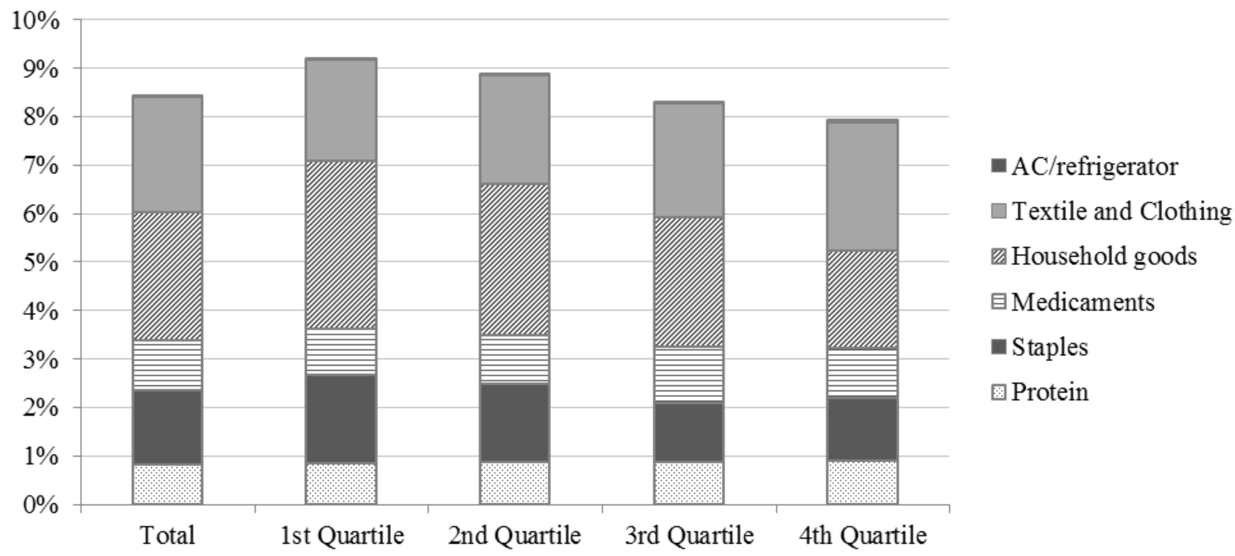
As an example of the type of calculation involved, in 2010 the World Bank carried out an analysis of Nigeria's import prohibitions, detailed in Treichel et al. (2012). The analysis went in three steps.

Step 1. Prices were compared between Lagos, Nigeria, and comparator cities. The data used were the Economist Intelligence Unit's City Data, which give local prices of consumption goods and services in major cities in the world. It is far from a perfect source given that the choice of products is slanted toward the typical consumption basket of an expatriate household, but currently it is the only source available on a wide and comparable basis. Prices for Cotonou, Benin, the best comparator, were unavailable, so Nairobi, Kenya, was chosen as a comparator. After correcting for cost of living differentials between Lagos and Nairobi, the price differential for products subject to import bans in Nigeria came out to a remarkable 77 per cent.

Step 2. The price differential was fed into the expenditure basket of every household in Nigeria's household survey using equation (8). Production data were not available. The average increase in the cost of living came out to about 9 per cent.

Step 3. The average increase in the cost of living was averaged at each quartile of the income distribution to assess its regressivity. The result is shown in figure 8. It can be seen that the effect is mildly regressive, as the burden is about 1 per cent higher at the bottom of the income distribution. All in all, it was calculated that the elimination of the import prohibitions could lift three million Nigerians out of poverty.

Figure 8: Regressivity of the effect of Nigeria's import bans on the cost of living



Source: World Bank (2010).

A full analysis would include the effect of the import bans' elimination on employment. However, in the case of Nigeria's import bans no data were available on employment in the sectors affected, and the firms involved in the domestic production of substitutes were largely in monopoly positions, which they used to raise prices rather than employment – a rational response to trade restrictions for firms with market power. Thus, the employment shock was likely to be moderate.

Another example of this type of calculation was conducted in 2012 by the World Bank to explore the implications of SPS measures for the cost of living across the distribution of income in Kenya. The analysis went in three steps.

The first step is to look at consumption patterns and calculate the share of food and non-food expenditure for households. Table 2 shows differences in household expenditure patterns across quintiles of the income distribution, from the 20 per cent poorest (Q1) to the 20 per cent richest (Q5). Unsurprisingly, the share of food and even more the share of food auto-consumption decreases with income.

Table 2: Distribution of household expenditure shares, by income quintile (%)

Group	*Food auto-consumption*	*Food purchased*	*Non-food item*	*Services*	***Good purchased***
Q1	32.9	40.7	13.0	13.3	53.7
Q2	27.0	40.6	15.6	16.8	56.2
Q3	22.2	40.1	18.2	19.5	58.3
Q4	18.1	37.3	20.4	24.2	57.7
Q5	9.1	22.2	22.8	45.9	45.0

Source: Authors' calculation based on Kenya Household Survey.

Note: Q1 is the bottom quintile, Q5 is the top. Numbers are percentage expenditure shares; lines add up to 100%.

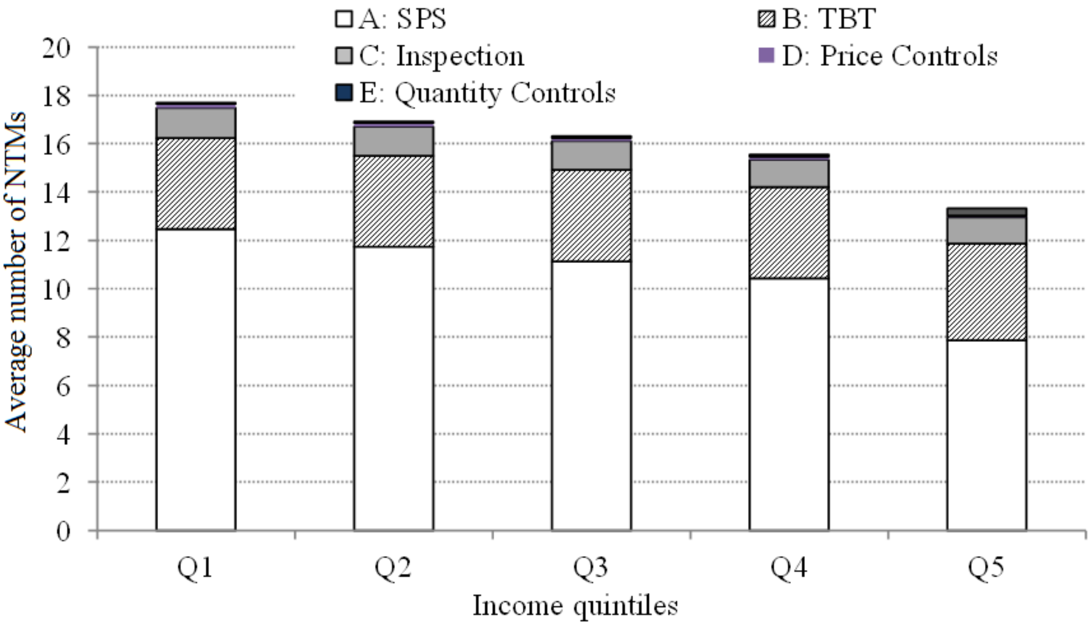
The second step is to calculate NTMs incidence. Let *i* denote a Kenyan household, ℓ a product defined according to the household survey (HHS) nomenclature, which is typically more aggregated than HS6 (the trade nomenclature at the level of which trade flows and NTMs are defined) and *k* a product at HS6.

Let $\overline{n}_\ell$ and $\overline{c}_\ell$ be, respectively, the average number and frequency index of NTMs imposed on HHS product category ℓ and let ω_ℓ^i be the weight of product ℓ in household *i*'s consumption basket. We define consumption-weighted NTM numbers and frequency index as

$$n^i = \sum_\ell \omega_\ell^i \overline{n}_\ell \quad \text{and} \quad c^i = \sum_\ell \omega_\ell^i \overline{c}_\ell$$

The figures below plot quintile averages of these two numbers across the distribution of income. Figure 9 shows that the number of measures goes down with income, essentially because of the weight of SPS measures in the total.

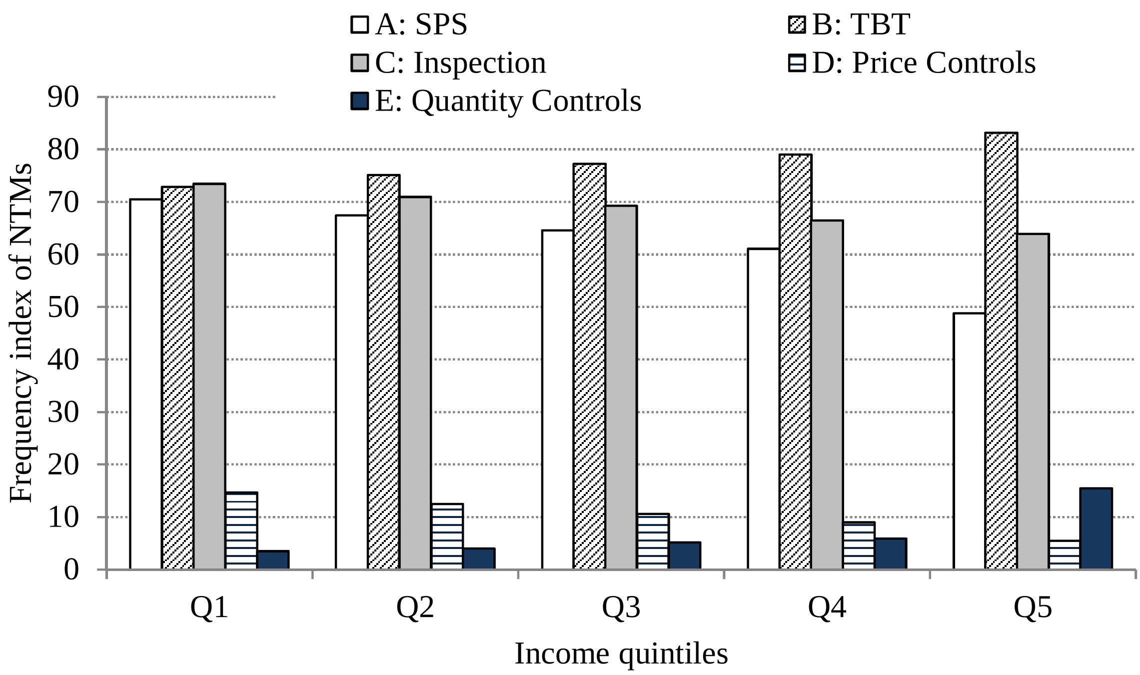
Figure 9: Average number of NTMs faced, by income group



Source: authors' calculation based on Household Survey and UNCTAD-TRAINS NTM database.

Figure 10 shows a more complex picture in terms of the frequency index. While the SPS frequency index goes down with income (because the weight of food goes down), the frequency indexes for TBT measures (product standards other than for sanitary reasons) and quantitative restrictions go up.

Figure 10: Frequency index of NTMs faced by income group



Source: authors' calculation based on Household Survey and UNCTAD-TRAINS NTM database.

The last step is to use estimations of AVE (for instance, here we use an AVE of SPS measures in food products calculated by Cadot and Gourdon, 2014a) and merge them with the average number of SPS measures for each product. These all concern foodstuffs in this example, as coefficients of SPS measures were the only ones significantly different from zero in Cadot and Gourdon (2014a).

Let $\bar{a}_{\ell} = \sum_{k} \hat{a}_{k\ell} / n_{\ell}$ be the simple average of the estimated AVEs of NTMs imposed on all HS6 products k belonging to HHS category ℓ . We defined a consumption-weighted AVE of SPS measures imposed on household i's consumption basket as

$$a^{i} = \sum_{\ell} \omega_{\ell}^{i} \bar{a}_{\ell}$$

Our approach consists of calculating averages of this magnitude at each centile of the income distribution.

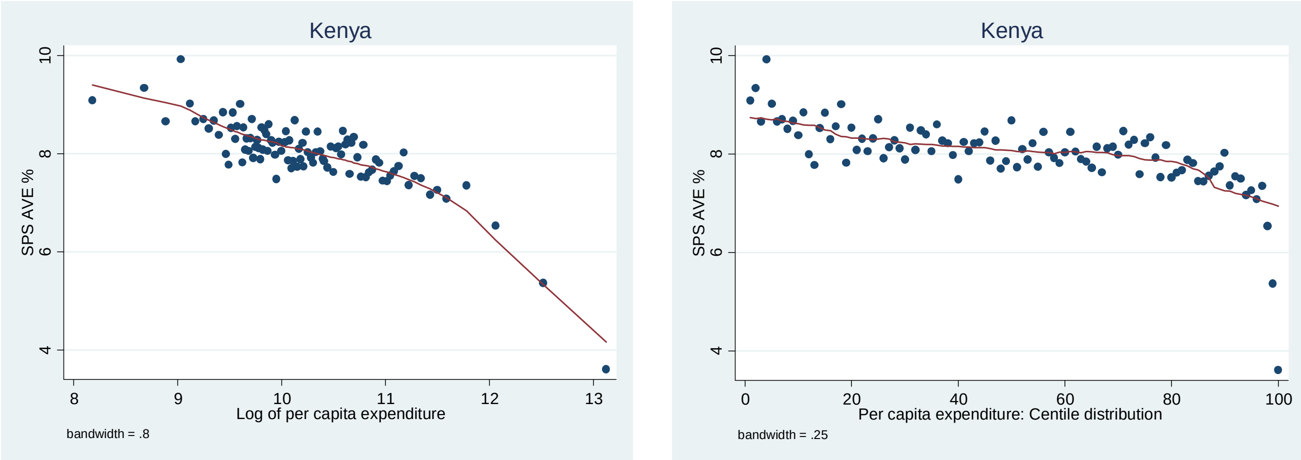
The result is plotted using a smoother regression[19] of the average value of a^i for each centile of the income distribution against the log of that centile's average income in panel (a), and on that centile's number (from 1 to 100) in panel (b) shown in figure 11.

[19] A "smoother regression" is a set of linear regressions estimated by observation over moving windows. The advantage of this procedure is that it allows for highly non-linear patterns, as it imposes no a priori functional form.

Figure 11: Price-raising effect of SPS faced by Kenyan households

(a) on log income

(b) on centiles of the income distribution



Both panels show that the incidence of SPS measures is regressive in Kenya, with consumption-weighted average AVEs going down from about 9 per cent for the 5th centile to 7 per cent for the 95th centile. This is a direct consequence of the decreasing weight of foodstuffs in household expenditure patterns. Again, it is worth stressing that this calculation is only half the story, as SPS measures are supposed to protect consumers from externalities (health hazards), and there is no particular reason to assume that benefits go up with income. However, if SPS measures are enforced arbitrarily with little relation to real issues on the ground, as suggested by the anecdotal evidence, they are regressive.

5. CONCLUSIONS

5.1 USE OF THIS "TOOLKIT" FOR REGIONAL INTEGRATION

This paper is all about bridging gaps. We connect data, analysis and policy perspectives in order to propose "tools" for policymakers to advance "deep" regional integration regarding NTMs.

The *first* "*bridge*" connects vast amounts of hard-to-grasp NTM data to a practical regulatory distance measure, which can be illustrated in a simple graph. The distance in regulatory structure is capable of comparing patterns of NTM regulation; in other words, do countries apply the same types of NTMs to imported products? The measure is highly flexible and can be aggregated or disaggregated to any relevant level.

Policymakers can use the tool to assess the status quo of NTM-related integration and to benchmark progress. For instance, is there already a "core" of similar regulatory structures within a regional group, and, if so, which countries diverge from it? Related to this, is there a "shortest" way to bring the whole group to a common NTM structure? In which industries are regulatory patterns already well harmonized, which ones are lagging behind, and for which country pairs? Which best practices can be learned from the industries that have made progress in this regard? The regulatory distance measure is a powerful tool that can provide answers to these questions.

A *second bridge* extends to policymakers at the more technical level. There are, of course, limitations to data-based methods such as the distance in regulatory structure. NTMs are so complex that there can be large differences even within the same NTM type at the most disaggregated level of the UNCTAD-MAST classification (122 distinct types). We therefore propose comparisons of the distance in regulatory stringency. This requires a case-study approach based on full-text regulations, which can be identified through the NTM database and the analysis of the distance in regulatory structure. In fact, comparisons of regulatory stringency are different for each NTM type; some need to be entirely qualitative, others allow more quantitative approaches. An example of each is provided in the paper (see section 2 above). These analyses are work-intensive and can only practically be done for a single product and a limited number of countries at a time. Nevertheless, they are necessary and very useful for technical experts working to harmonize NTMs in a region.

As a next step, we employ a price-gap based technique to estimate the price increasing effect of NTMs for broader categories of NTMs (SPS, TBT and other NTMs). In addition, region- and sector-specific estimates are provided in the appendix. The results are pertinent: worldwide averages of AVEs for all NTMs together are in the range of 26–27 per cent in the animal and vegetable sectors, through 14–16 per cent for textiles and clothing as well as machinery and vehicles, to about 5–7 per cent for minerals and paper. SPS and TBT measures account for the bulk of these AVEs, especially in Europe.

These results link back to the high relevance of looking at the regulatory distance, rather than simply counting applied measures or calculating coverage ratios. Harmonization of measures must be the new paradigm. SPS and TBT are the NTMs of our time. These measures are justified by legitimate objectives such as the protection of health, safety or the environment. Therefore, "elimination" is not an option; harmonization and mutual recognition are the key.

Still, quantitative restrictions are relevant in Asia, Latin America and Africa, especially in food-related products and in some industrial sectors. However, their use is declining, driven by WTO disciplines and similar provisions in RTAs.

The *third bridge* links the above-mentioned cross-country estimations of the AVEs back to more concrete and specific cases. Policymakers and negotiators need to be able to identify more concrete cases to work on, rather than simply being aware of the "bigger issue" of NTMs. We look at the unexplained AVE estimation residuals; that is, where the actual traded price of a product in a specific market is still higher than predicted by the model with the average AVE of NTMs. The main explanations for this would be a more-than-average restrictiveness of specific NTMs, monopolistic/oligopolistic markets or certain demand patterns. The estimation residual can thus help us to "flag" suspicious cases. At this point we need to go deeper into the details to find explanations. The estimates alone do not suffice, but they provide very useful evidence to motivate the reduction of the costs associated with NTMs. Both perspectives combined are powerful.

The question we ask at this point is: who pays the price? Anecdotal evidence is derived from a specific example, but it provides food for thought as it is likely to be, in fact, a common scenario. We dare to generalize in the following. In a business transaction between importer and exporter, trade barriers add costs. These costs are likely to be added to the price of the product. In fact, this is the effect we are measuring in our AVE estimates. However, in oligopolistic or monopolistic markets, the importer and seller on the domestic market can pass on the higher price to the consumer. The consumer can be either an end consumer (the general public), or a downstream producer in a value chain. In the latter case, the more expensive inputs will reduce the competitiveness of the concerned industry. This also has implications for efforts to reduce trade barriers associated with NTMs. Neither the importer nor even the foreign exporter may really be concerned by the additional cost, as they will not pay the price. Governments need to take into account who really suffers from trade costs: namely, the final consumer at home and the domestic industry.

With the *fourth bridge* we try to build links between cross-country estimates of AVEs and national welfare in a particular country. High-level policymakers need know how big the impact of NTMs is, expressed in a measure that concerns their constituents. We link the price increases through NTMs to consumption patterns obtained from a Kenyan household survey. Since this method does not consider the aforementioned impacts on value chains, productivity and industrialization, the results are as modest as they could be. In spite of that, what these results tell us is important. The cost of living increases by 9 per cent for the poorest 20 per cent of the population; for the richest 20 per cent of the people, it increases by 7 per cent. In other words, beyond generally increasing the cost of living, NTM-related price increases also have a distributional effect. This effect is caused by the higher share of food items in the consumption basket of poorer people.

We conclude with a cautionary note. This paper has focused on the costs of NTMs. However, many NTMs are imposed for valid non-trade reasons, including the protection of public health or the environment (see Beghin, Disdier and Marette (2012) for a discussion, model and estimation). Focusing exclusively on the cost side would lead to severely flawed policy advice with potentially serious consequences if it led to the elimination of measures that play a crucial role in protecting human health or the environment. A balanced and holistic analysis of NTMs must involve full cost-benefit analysis, potentially complemented by cost-effectiveness analysis when several instruments are available. Such analysis is highly complex and will only be possible for one specific policy at a time. Much research is needed in this area, as well as more interdisciplinary dialogue between natural science and economics.

5.2 FUTURE DIRECTIONS AND RECOMMENDATIONS FOR DATA COLLECTION

All of the above-mentioned estimates and techniques rest upon the shoulders of good-quality data collected in a harmonized way. This study has highlighted some aspects of the rich palette of potential uses of the NTM data that UNCTAD, together with its partners (African Development Bank, International Trade Centre and World Bank), has been collecting in the last few years. The analytical exercises illustrated here show only a few of the potential uses of the data in policy advice; many more will develop as researchers and analysts become increasingly aware of the data's availability and convinced of its accuracy.

While the collection of NTM data on a consistent basis for over 60 countries around the world has been a very substantial achievement, two priority axes stand out in pursuing the effort: (i) extending coverage and (ii) collecting repeated waves of data.

First, as the identification of the effects of NTMs on trade, prices and the economy at large relies on cross-country and cross-product variations in patterns of NTM use, extending the coverage of data collection is key not only to ensure transparency worldwide (and a "fair" exposition of all countries) but also to improve the accuracy of estimates. In particular, it is crucial to cover large industrial markets as well as middle-income countries.

Second, with only a single year of NTM data available, identification relies only on cross-country and cross-product variation. This type of identification is vulnerable to confounding influences and endogeneity bias. However sophisticated econometric techniques might be used to filter them out. The collection of repeated waves of data is a priority step, especially given that updating is likely to be substantially less costly and complex than the initial collection. Repeated collection will also improve the accuracy of the data itself, as issues are revisited, definitions better understood and agencies become more aware of the effort and its potential usefulness.

There is a definite danger that the NTM data collection of the last few years remains a "one-shot" exercise, which would be a tremendous wasted opportunity given the awareness and momentum that it is generating. It will be essential to progressively put in place effective governance mechanisms to ensure that data are collected on a repeated basis, initially with funding from donors, but, it is to be hoped, on a sustainable basis in the long run.

REFERENCES

Amurgo Pacheco A (2006). Mutual recognition agreements and trade diversion: consequences for developing nations. Working Paper No. 20-2006. Graduate Institute of International Studies. Geneva.

Auer R and Schoenle R (2013). Market structure and exchange-rate pass-through. Mimeo. Swiss National Bank and Brandeis University.

Augier P, Cadot O and Dovis M (2013). Impact of non-tariff measures on Moroccan firms. Mimeo. University of the Mediterranean (Aix-Marseille II).

Beghin J, Disdier A and Marette S (2012). Trade restrictiveness indices in presence of externalities: an application to non-tariff measures. *Canadian Journal of Economics* (forthcoming).

Berthou, A and Emlinger C (2011), "The Trade Unit Values Database," Working Paper 2011-10. CEPII, Paris.

Cadot O and Gourdon J (2014a). Assessing the price-raising effect of non-tariff measures in Africa. *Journal of African Economies*. 23(4): 425–463.

Chen M and Mattoo A (2008). “Regionalism in standards: good or bad for trade?”. *Canadian Journal of Economics*. 41(3): 838–863.

Czubala W, Shepherd B and Wilson J (2009). Help or hindrance? The impact of harmonized standards on African exports. *Journal of African Economies*. 18(5): 711–744.

Disdier A, Fontagné L and Cadot O (2014). North-South standards harmonization and international trade. *The World Bank Economic Review*.

Goldberg PK and Maggi G (1999). Protection for sale: an empirical investigation. *The American Economic Review*. 89(5): 1135–1155.

Grossman GM and Helpman E (1994). Protection for sale. *The American Economic Review*. 84(4): 833–850.

Kee, H. L., A. Nicita and M. Olarreaga (2009). Estimating trade restrictiveness indices. *Economic Journal*, 119: 172–199.

Keyser J (2013). Opening up the markets for seed trade in Africa. Africa Trade Working Paper No. 2. World Bank. Washington, DC.

Knebel, C (2010). Measuring the price effects of import restrictions: theory and evidence. Mimeo, Available at <http://ssrn.com/abstract=2354487>.

Lee JW and Swagel P (1997). Trade barriers and trade flows across countries and industries. *Review of Economics and Statistics*. 79(3): 372–382.

Moenius J (2004). Information versus product adaptation: the role of standards in trade. International Business and Markets Research Center Working Paper. Northwestern University.

Piermartini R and Budetta M (2009). A mapping of regional rules on technical barriers to trade. In: Estevadeordal A, Suominen K and Teh R, eds. *Regional Rules in the Global Trading System*. Cambridge University Press. Cambridge: 250–315.

Trefler D (1993). Trade liberalization and the theory of endogenous protection: an econometric study of U.S. import policy. *Journal of Political Economy*. 101(1): 138–160.

Treichel V, Hoppe M, Cadot O and Gourdon J (2012). Import bans in Nigeria create poverty. Africa Region Policy Note No. 28. World Bank. Washington, DC.

APPENDIX

This appendix details the method used to generate the two-dimensional projection of regulatory distances in section 2. Let *i* and *j* index countries and D_{ij} stand for the distance between *i* and *j*. The dissimilarity matrix is

$$\Delta = \begin{bmatrix} D_{11} & \dots & D_{1m} \\ \dots & \dots & \\ D_{m1} & \dots & D_{mm} \end{bmatrix} \tag{10}$$

is a square, symmetric matrix with zeros on the diagonal and bilateral distances off the diagonal. Multidimensional scaling (MDS) consists of finding *m* coordinate vectors $\mathbf{x}_i$ (one for each country) such that, using an appropriate distance metric (noted $\| \ \|$),

$$D_{ij} \approx \left\| \mathbf{x}_i - \mathbf{x}_j \right\| \tag{11}$$

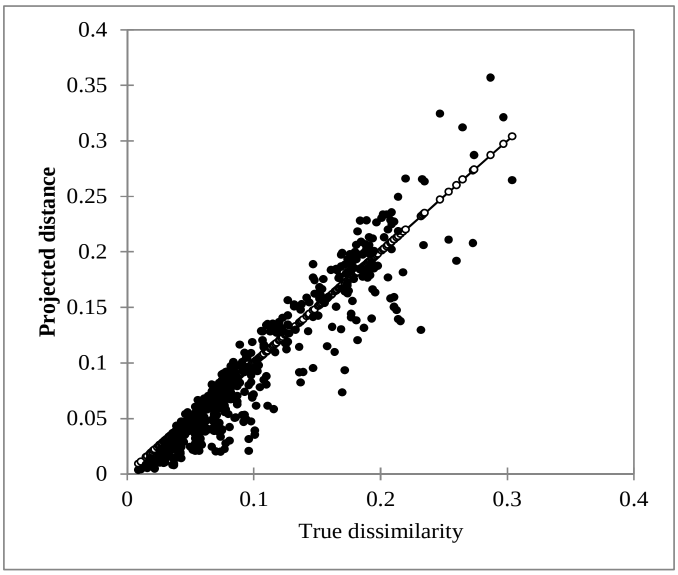
i.e. the projection of the individuals onto a space of less than *m* dimensions represents reasonably well their true dissimilarity. If the space had *m* dimension, the representation would be perfect; as the number of dimensions shrinks (e.g. to two in a plane projection such as the one shown in the figure 1) the distortion potentially grows.

The most usual way of formulating the problem is to minimize a quadratic loss function:

$$\min_{\mathbf{x}_1,\dots,\mathbf{x}_m} \sum_{i<j} \left(D_{ij} - \left\| \mathbf{x}_i - \mathbf{x}_j \right\| \right)^2 \tag{12}$$

Figure A1 shows the distortion imposed by MDS onto a two-dimensional space for our regulatory distance measure by plotting true dissimilarities (true values of the regulatory distance) on the horizontal axis and represented ones on the vertical axis.

Figure A1. Distortion due to two-dimensional projection of regulatory distances



Source: Authors' calculations using UNCTAD-TRAINS NTM database.

Table A1: Classification of harmonization clauses in RTAs

	AFTA (road vehicles)	Aladi	Andean Community	CACM	Caricom	CEFTA	COMES A	EFTA	SADC	SAFTA
Reference to WTO-TBT Agreement	0	1	0	0	0	0	0	0	0	0
definitions	0	1	0	0	0	0	0	0	0	0
rules	0	0	0	0	0	0	0	0	0	0
specific provisions	0	0	0	0	0	0	0	0	0	0
Standards:										
(i) Mutual Recognition	0	0	0	0	0	0	0	0	0	0
- Is mutual recognition in force?	0	0	0	0	0	0	0	0	0	0
- Is there a time schedule for achieving mutual recognition?	0	0	0	0	0	0	0	0	0	0
- Is the burden of justifying non-equivalence on the importing country?	0	0	0	0	0	0	0	0	0	0
(ii) Harmonization	0	1	1	0	1	0	1	0	0	1
- Are there specified existing standards to which countries shall harmonize?	0	0	0	0	0	0	0	0	0	0
- Is the use or creation of regional standards promoted?	0	1	1	0	0	0	1	0	0	0
- Is the use of international standards promoted?	0	1	0	0	1	0	1	0	0	0
Technical Regulations										
(i) Mutual Recognition	0	0	0	1	0	0	0	0	0	0
- Is mutual recognition in force?	0	0	0	0	0	0	0	0	0	0
- Is there a time schedule for achieving mutual recognition?	0	0	0	0	0	0	0	0	0	0
- Is the burden of justifying non-equivalence on the importing country?	0	0	0	0	0	0	0	0	0	0
(ii) Harmonization	1	1	1	1	1	0	1	0	0	0
- Are there specified existing standards to which countries shall harmonize?	1	0	0	0	0	0	0	0	0	0
- Is the use or creation of regional standards promoted?	0	1	1	0	0	0	1	0	0	0
- Is the use of international standards promoted?	0	1	0	1	1	0	1	0	0	0
Conformity Assessment										
(i) Mutual Recognition	1	1	0	1	1	0	1	1	0	1
- Is mutual recognition in force?	1	0	0	0	0	0	0	1	0	0
- Is there a time schedule for achieving mutual recognition?	0	0	0	0	0	0	0	0	0	0
- Do parties participate in international or regional accreditation agencies?	0	0	0	0	0	0	0	0	0	0
- Is the burden of justifying non-equivalence on the importing country?	0	0	0	0	0	0	0	0	0	0
(ii) Harmonization	0	1	1	1	0	0	1	0	0	0
- Are there specified existing standards to which countries shall harmonize?	0	0	0	0	0	0	0	0	0	0
- Is the use or creation of regional standards promoted?	0	0	1	0	0	0	1	0	0	0
- Is the use of international standards promoted?	0	1	0	0	0	0	1	0	0	0
III. Transparency Requirements	1	1	1	1	1	1	0	1	0	0
(i) Notification	1	1	1	1	0	1	0	1	0	0
- Is the time period allowed for comments specified?	0	0	1	0	0	0	0	1	0	0
- Is the time period allowed for comments longer than 60 days?	0	0	1	0	0	0	0	0	0	0
(ii) Contact points/consultations for exchange of information	0	1	1	0	1	0	0	0	0	0

Table A1 (continued)

	AFTA (road vehicles)	Aladi	Andean Community	CACM	Caricom	CEFTA	COMES A	EFTA	SADC	SAFTA
Institutions	0	1	1	1	1	1	1	1	0	0
(i) Administrative Bodies	0	1	1	1	1	1	1	1	0	0
- Is a regional body established?	0	1	1	1	1	1	1	1	0	0
(ii) Dispute Settlement Mechanism	0	1	1	0	1	0	0	1	0	0
- Is there a regional dispute settlement body?	0	1	1	0	1	0	0	1	0	0
- Are there regional consultations foreseen to resolve disputes?	0	1	1	0	1	0	0	1	0	0
- Is there a mechanism to issue recommendations?	0	1	1	0	1	0	0	1	0	0
- Are recommendations mandatory?	0	0	1	0	0	0	0	0	0	0
- Is the recourse to the DS for technical regulations disallowed?	0	0	0	0	0	0	0	0	0	0
Further Cooperation Among Members	0	1	1	1	1	1	1	0	1	0
(i) Common policy/standardization programme (beyond trade-related objecti	0	0	0	0	1	0	1	0	1	0
(ii) Technical Assistance	0	1	1	1	1	0	1	0	0	0
(iii) Metrology	0	1	1	1	1	1	1	0	0	0

Source: Adapted from Piermartini and Budetta (2009).

Table A2: Ad valorem equivalent with price-based estimation by region and industries

Latin America	Average AVE over all HS-6 products			
	SPS (A)	TBT (B)	Other NTMs (C, D or E)	NTM (Total)
1 Animals	14.0	4.3	8.7	27.0
2 Vegetables	21.2	2.7	5.3	29.2
3 Fats & oils	5.6	2.3	6.1	14.0
4 Beverages & tobacco	8.5	7.4	4.0	19.9
5 Minerals	0.7	0.6	2.1	3.4
6 Chemicals	3.0	2.9	4.5	10.5
7 Plastics	0.2	2.3	1.1	3.6
8 Leather	1.5	3.6	7.6	12.7
9 Wood products	5.1	1.1	5.8	12.0
10 Paper	0.1	1.0	2.0	3.1
11 Textile and clothing	0	8.5	5.8	14.3
12 Footwear	0	7.0	5.0	12.0
13 Stone & glass	0	1.5	1.4	2.9
14 Pearls	0	0.2	0.0	0.2
15 Metals	0	2.0	2.2	4.2
16 Machinery	0	2.2	4.3	6.5
17 Vehicles	0	6.0	5.2	11.2
18 Optical & med. Instr.	0	3.4	5.1	8.6
19 Arms	0	0.5	11.2	11.7
20 Miscellaneous	0	4.1	2.3	6.4
	3.0	3.2	4.5	10.7

EUN	Average AVE over all HS-6 products			
	SPS (A)	TBT (B)	Other NTMs (C, D or E)	NTM (Total)
1 Animals	23.0	13.5	1.8	38.3
2 Vegetables	22.1	7.9	0.3	30.3
3 Fats & oils	21.5	2.8	0.0	24.3
4 Beverages & tobacco	12.4	12.6	0.6	25.5
5 Minerals	0.0	6.1	0.0	6.1
6 Chemicals	0.1	16.6	0.0	16.7
7 Plastics	0.0	17.1	0.1	17.2
8 Leather	9.1	5.1	0.0	14.2
9 Wood products	0.0	5.2	0.0	5.2
10 Paper	0.1	4.2	0.0	4.3
11 Textile and clothing	0	12.5	5.1	17.6
12 Footwear	0	16.4	0.0	16.4
13 Stone & glass	0	12.4	0.0	12.4
14 Pearls	0	5.2	0.0	5.2
15 Metals	0	11.9	1.2	13.1
16 Machinery	0	20.5	0.0	20.5
17 Vehicles	0	19.0	0.0	19.0
18 Optical & med. Instr.	0	23.9	1.6	25.5
19 Arms	0	0.0	0.0	0.0
20 Miscellaneous	0	13.6	0.0	13.6
	4.4	11.3	0.5	16.3

Africa	Average AVE over all HS-6 products			
	SPS (A)	TBT (B)	Other NTMs (C, D or E)	NTM (Total)
1 Animals	9.5	4.2	4.6	18.3
2 Vegetables	14.2	2.7	2.3	19.2
3 Fats & oils	7.8	0.2	3.9	11.9
4 Beverages & tobacco	11.4	5.8	2.9	20.2
5 Minerals	4.6	8.2	1.8	14.6
6 Chemicals	5.6	5.8	2.9	14.3
7 Plastics	0.1	8.1	1.3	9.6
8 Leather	5.4	5.5	3.6	14.5
9 Wood products	4.3	6.7	0.6	11.6
10 Paper	0.0	9.0	0.8	9.9
11 Textile and clothing	0	6.4	2.5	8.8
12 Footwear	0	9.2	3.3	12.5
13 Stone & glass	0	8.3	4.3	12.6
14 Pearls	0	3.1	6.2	9.2
15 Metals	0	9.6	4.8	14.4
16 Machinery	0	11.3	10.4	21.7
17 Vehicles	0	9.2	4.0	13.2
18 Optical & med. Instr.	0	11.1	6.1	17.2
19 Arms	0	5.9	9.5	15.4
20 Miscellaneous	0	12.6	3.9	16.6
	3.2	7.1	4.0	14.3

Asia	Average AVE over all HS-6 products			
	SPS (A)	TBT (B)	Other NTMs (C, D or E)	NTM (Total)
1 Animals	23.1	3.7	4.4	31.2
2 Vegetables	21.3	1.7	3.2	26.2
3 Fats & oils	10.7	2.1	1.4	14.2
4 Beverages & tobacco	17.7	3.8	3.2	24.7
5 Minerals	0.0	2.8	1.0	3.8
6 Chemicals	0.8	8.0	3.5	12.4
7 Plastics	0.4	4.1	0.3	4.8
8 Leather	10.6	6.0	0.0	16.6
9 Wood products	5.3	1.0	0.6	6.9
10 Paper	1.2	0.3	10.5	12.0
11 Textile and clothing	0	1.1	13.1	14.2
12 Footwear	0	2.9	9.6	12.5
13 Stone & glass	0	0.1	2.0	2.1
14 Pearls	0	1.8	6.6	8.4
15 Metals	0	3.4	11.0	14.4
16 Machinery	0	4.1	14.4	18.5
17 Vehicles	0	1.5	13.8	15.3
18 Optical & med. Instr.	0	2.6	3.4	6.0
19 Arms	0	22.8	8.3	31.1
20 Miscellaneous	0	3.3	5.6	8.9
	4.6	3.9	5.8	14.2

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