Olivier Cadot and Julien Gourdon

Assessing the Price Raising Impact of Non-Tariff Measures in Africa

Ample anecdotal evidence summarized in, inter alia, Gillson (2011) and Charalambides and Gillson (2011) suggests that non-tariff measures (NTMs), whether protectionist in intent or not, raise trade costs and inhibit regional trade in Africa. Beyond old-style quantitative restrictions (QRs) and bans, even measures that could be potentially justified by market failures like Sanitary and Phytosanitary (SPS) measures or product standards are often ill-suited to both consumer protection needs and State monitoring capabilities, generating unnecessary hurdles. The result is, potentially, higher prices hurting low-income households.

However, beyond the anecdotal evidence, little is known about the magnitude of the price-raising effects involved. The incidence of NTMs—how prevalent they are—is usually measured by so-called “coverage ratios” which are in essence simple counts of how many products, say at the HS6 level\(^1\), are covered by one or more NTM. The product lines can also be weighted by the amount of imports. However, this tends to understate the importance of restrictive NTMs since imports will be reduced where they are most restrictive.

\(^1\) Not all NTMs are necessarily Non-tariff barriers: some NTMs may not be unduly trade restrictive with many of these measures being applied for genuine public policy objectives however, barriers to trade may arise through bad design and/or weak implementation. The book De-Fragmenting Africa illustrates that key barriers to trade in Africa arise from non-tariff measures. [http://go.worldbank.org/MKK3U1Y2D0](http://go.worldbank.org/MKK3U1Y2D0)

\(^2\) The Harmonised System (HS) is a common product classification used for the coding of imports and exports. The 6 digit level is the lowest level at which codes are harmonised globally and includes around 5000 separate product descriptions.
Similarly, if a particular NTM becomes more restrictive and reduces imports then the coverage indicator may actually fall - the opposite of what should happen.

Making the NTM more restrictive may then reduce the coverage ratio, which is the opposite of what a coverage ratio is supposed to pick up. This is a well-known problem which affects weighted-average tariffs as well. As for the NTMs’ effect on trade (their severity), an important strand of the literature has focused on the variation in trade flows induced by the presence of NTMs to infer their ad-valorem equivalents (AVEs), i.e. the rate at which tariffs would have the same effect on trade flows (Deardorff and Stern (1998) or Kee et al. (2009)).

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Another strand, on which this paper draws, has sought to estimate AVEs by comparing directly home (NTM-ridden) product prices with the prices of similar products on markets where those products are free of distortions, in order to obtain an estimated “price gap”. This method can be applied by simple comparison of averages on a case-by-case basis (a prominent example of this approach is the recent database of agricultural distortions compiled at the World Bank—see Anderson et al. 2008; see Ferrantino 2006 for other examples), or econometrically (see e.g. Andriamanjara et al. 2004). In the latter case, the authors regress prices collected by the Economist Intelligence Unit at the city level (to guide expatriate compensation) on suitably coded NTMs at the national level as well as control variables.

We follow the price-based strand of the literature and estimate the price-raising effect of NTMs by combining two databases. The first one was compiled as part of the World Bank’s International Comparison Project (ICP) and contains prices for 63 products and 42 services in 147 countries for the year 2005. Unfortunately, the results of a new wave of data collection for the year 2011 are not yet available. Data made available to the public is very limited, so we used the more complete database available only to World Bank staff. The second is an NTM database compiled as part of a multi-agency project to replenish the UNCTAD Trade Analysis and Information System (TRAiNS) database.

Data and Stylized Facts: What are NTMs?

The term “NTM” designates a vast array of heterogeneous regulatory instruments. The simplest way of characterizing them is through the Multi-Agency Support Team (MAST) nomenclature, adopted by UNCTAD’s Group of Eminent Persons in July 2009. This nomenclature is currently under revision by the World Trade Organization’s (WTO) legal department in order to make it suitable for the notification of measures by member states; it will thus change in the near future, but changes are unlikely to be drastic. The logical structure of the nomenclature, at its highest degree of aggregation, is shown in Figure 1.
Categories A and B (Sanitary and Phytosanitary - SPS and Technical Barriers to Trade - TBT measures) are often referred to as “technical” ones. Categories C to O are non-technical ones and cover a mixture of command-and-control types of measures (price controls, quantitative restrictions and prohibitions) and a disparate set of measures. Some, like pre-shipment inspection (category C), are easy to track and affect all products. Some, like taxes and para-tariff measures (category F) are much easier to track as they are often administered in a transparent way, serving ostensibly to finance border-management administrations whose function is not always clear. As for measures G to O (in italics), some of them are important and relatively straightforward to identify, like anti-competitive measures like forced channels (category H) and distribution restrictions (J). Some other are very difficult to code at the product level, like Trade-Related Investment Measures (TRIMS) (I) or intellectual property (N). Subsidies (L) are a particularly difficult case because of the loose definition given by the MAST:

“Financial contribution by a government or government body to a production structure, being a particular industry or company, such as direct or potential transfer of funds (e.g. grants, loans, equity infusions), payments to a funding mechanism and income or price support”

Subsidies are often to certain companies and not to other depending on their location, ownership status (ethnic minorities, special groups and so on), or type (SMEs). It is difficult to track all subsidies granted under the myriad of schemes typically in place to serve various societal purposes, and even more difficult to decide when they are sufficiently prevalent to be ascribed to a particular product.

Rules of origin are another category of non-tariff measure. They are required in preferential trade agreements to identify which countries are eligible for reduced or zero tariffs. However, they can be designed in a way which makes them costly to satisfy, which limits the impact of the trade preferences. Rules of origin are also necessary to apply contingent protection measures such as anti-dumping and safeguard measures.

Thus, including them in the MAST nomenclature gives an appearance of exhaustivity but are difficult to operationalize for quantitative work.

Lastly, export measures (category P) are of growing importance, especially for foodstuffs in times of rising food prices. Gillson (2011) argues that export restrictions in times of high prices contribute to reduce incentives to expand production, and thus make shortages worse both
over time (because supply does not react) and across space (as producers in surplus regions are banned from arbitraging price differences, so price spikes in deficit regions are not dampened by increased imports). Thus, export restrictions exert negative regional externalities and increase consumer price volatility.

**Data: NTMs in Africa**

Data on NTMs is available through a recent data collection effort undertaken jointly by the World Bank, UNCTAD and the African Development Bank. The data consists of tables with HS6 products in rows and NTMs, coded according to the 2009 MAST nomenclature, in columns. It also contains references to the relevant legal texts as well as indications on the issuing and/or enforcing agency. The data has been collected either by national governments under the coordination of regional secretariats, as in Latin America, or by local consultants hired by the World Bank or the African Development Bank. In the latter case, it has been endorsed by governments through validation workshops held at the end of the data collection process.

By and large, the proportion of imported goods subject to NTMs is large, as shown in Figure 2 where the LHS shows the proportion of product lines covered by NTMs (the frequency ratio) and the RHS shows the share of imports (the coverage ratio). It can be seen that East African countries have fairly high coverage ratios, with the exception of Tanzania and Madagascar. In accordance with the analysis of the previous section, the E.U. has very high frequency and coverage ratios, as public demands for traceability and product safety are very high. However, one would expect that low-income countries with low monitoring and testing capabilities would be able to handle fewer measures and therefore put fewer on the books. This is not the case, suggesting, as argued by Gillson (2011), that there is some overkill even in “modern-type” measures like SPS and technical regulations.

In addition, some countries, like Kenya and Burundi, are characterized by the simultaneous application of many measures (up to five) to the same product, as shown in Figure 3. This may well translate into overly complicated compliance verification processes for traders.

Patterns of coverage by type of foodstuff product seem to vary more systematically by country than by product, as shown in Figures 4 and 5. Madagascar and Senegal have relatively few measures on fats & oils, vegetable products and prepared foods compared to other countries. The case of live animals is special given that a large part of the trade in live animal across African borders is informal and escapes controls, so that measures applied to this category of product are largely notional—although this remark applies to varying extents to many products and countries on the continent.

Lastly, the data suggests that old-style command-and-control measures (quantitative restrictions (QRs) and price controls) have largely receded in the region, at least on the books, with the exception of Namibia. However, this data should be interpreted cautiously as NTM inventories record only permanent measures and almost only those affecting imports, whereas Gillson (2011) notes numerous instances of temporary bans, especially on exports. Thus, the picture should be seriously nuanced in view of the data’s incompleteness for a category of measures that is, judging by anecdotal evidence, on the rise.

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3 However, it should be kept in mind that—at least in principle—they reduce producer-price volatility, as local prices co-vibrate negatively with volumes in autarky, whereas they don’t under integrated markets with a given international price.
Figure 2: Proportion of HS6 product lines and imports covered by one or more NTM

<table>
<thead>
<tr>
<th>Share of Product Lines</th>
<th>Share of Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>Asia</td>
</tr>
<tr>
<td></td>
<td>MENA</td>
</tr>
<tr>
<td></td>
<td>LAC</td>
</tr>
<tr>
<td></td>
<td>Tanzania</td>
</tr>
<tr>
<td></td>
<td>Senegal</td>
</tr>
<tr>
<td></td>
<td>Madagascar</td>
</tr>
<tr>
<td></td>
<td>South Africa</td>
</tr>
<tr>
<td></td>
<td>Mauritius</td>
</tr>
<tr>
<td></td>
<td>Namibia</td>
</tr>
<tr>
<td></td>
<td>Kenya</td>
</tr>
<tr>
<td></td>
<td>Uganda</td>
</tr>
<tr>
<td></td>
<td>Burundi</td>
</tr>
</tbody>
</table>

Figure 3: Frequency ratios by number of NTMs applied simultaneously to the same good

- 5 and more
- 4 types of NTMs
- 3 types of NTMs
- 2 types of NTMs
- 1 type of NTMs
All in all, the picture that emerges is one where SPS measures and technical regulations have spread while QRs and prohibitions have receded, but this overall picture masks two important stylized facts: (i) Many SPS measures seem to be ill-designed given local monitoring and testing capabilities; (ii) many temporary QRs, on the import and the export side, still disrupt the functioning of regional food markets. For instance, Gillson and Charalambides (forthcoming) note that up to one third of intra-SADC trade is potentially affected by non-tariff barriers notified under the SADC monitoring mechanism (Table 1).

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Examples of products affected</th>
<th>% of intra-SADC trade potentially affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import bans, quotas &amp; levies</td>
<td>Wheat, beer, poultry, flour, meat, maize, UHT milk, cement, sugar, eggs, pasta, sorghum, pork, fruit &amp; vegetables</td>
<td>6.1</td>
</tr>
<tr>
<td>Preferences denied</td>
<td>Salt, fishmeal, pasta</td>
<td>0.4</td>
</tr>
<tr>
<td>Import permits &amp; levies</td>
<td>UHT milk, bread, eggs, sugar, fruit &amp; vegetables, livestock, liquor, cooking oils, maize, oysters</td>
<td>5.4</td>
</tr>
<tr>
<td>Single marketing channels</td>
<td>Wheat, meat, dairy, maize, tea &amp; tobacco, sugar</td>
<td>5.3</td>
</tr>
<tr>
<td>Rules of origin</td>
<td>Textiles &amp; clothing, semi-trailers; palm oil, soap; cake decorations; rice; curry powder; wheat flour</td>
<td>3.0</td>
</tr>
<tr>
<td>Export taxes</td>
<td>Dried beans, live animals, hides, skins, sugar, tobacco, maize, meat, wood, coffee</td>
<td>4.8</td>
</tr>
<tr>
<td>Standards/SPS/TBT</td>
<td>Milk, meat, canned tuna, beer, honey, maize bran, cotton cake, poultry, batteries, sugar, coffee, ostriches</td>
<td>2.5</td>
</tr>
<tr>
<td>Customs-related</td>
<td>Wine, electronic equipment, copper concentrate, salt, cosmetics, medicines</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32.7</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Gillson and Charalambides (2011)*
In a recent firm-level survey carried out in five SADC countries cited by Gillson and Charalambides (forthcoming), “roughly 80 percent of the respondents indicated that they faced some form of trade barrier within the region [...]. Over half of the respondents indicated that the cost of these was equivalent to 5 percent of the Cost, Insurance and Freight (CIF) value of the imports/exports. A further 24 percent of respondents indicated a 5-15 percent attribution to trade barriers; and, 23 percent faced increased trade costs of over 15 percent” (p. 4). We will see later on in this paper that the econometric estimation of ad-valorem equivalents (AVEs) of NTMs yields estimates in that range.

Estimation and Results

From our estimations we find that SPS measures in Africa raise prices by anything between 12-25%. AVEs for TBT measures are not estimated sufficiently precisely to reject the null hypothesis of no effect. This is in accordance with intuition, as product standards are likely to have very heterogeneous effects depending on how they are administered on the ground—in SSA, standard-enforcement agencies are often empty shells in practice. PSI and other formalities have price-raising effects ranging between 14% and 21%. Price measures, surprisingly, have no significant effect, again a reflection of their heterogeneity. By contrast, QRs have, where they are significant, a price-raising effect of 19%. Needless to say, these estimated effects must be interpreted very cautiously in view of their weak identification.

We find that SPS measures raise substantially the price of cereals in Kenya, with AVEs of 42% for rice and 39% for other cereals. Although our AVEs are corrected for tariffs, it is possible that the one on rice picks up some tariff effect, as the tariff on rice indicated in the TRAINS database (and used in this paper) is 57%, whereas a United States Department of Agriculture (USDA) document (USDA 2010) mentions the imposition of a 7.5% common external tariff on rice in the EAC starting in 2005. If the USDA figure was right, our 42% AVE would pick up 18% (7.5 – 57) that is actually attributable to the CET, which would leave a more reasonable AVE of 24%. Clearly, something happened to the rice market in Kenya in 2005, as shown in Figure 6.

Figure 6: Rice consumption per capita, Kenya

![Figure 6: Rice consumption per capita, Kenya](image)

Source: USDA (2010). Note: Kilos per capita per year

However, it is difficult to ascribe this turning point in consumption to changes in the NTM regime, as most of the regulations affecting rice are based on the 1923 Plant protection Act and do not seem to have been affected by new measures taking effect in 2005. Of course, one cannot rule out changes in implementation policies, but the adoption of the CET is a more plausible candidate.

In Uganda, rice and other cereals fetch the highest AVE, at 30%. The remark above about the rate of the EAC CET starting in 2005 applies to Uganda as well, so the AVE should be also interpreted cautiously. With a CET at 7.5%, it would fall to 12% instead of 30%. Domestic rice production has been encouraged by Ugandan...
authorities since the beginning of the 2000s, with several projects financed by Japan and other donors to promote smallholder production. Consumption has also been rising substantially (by a factor of three over a decade, according to informal estimates by the FAO representative in Kampala), in spite of the rising domestic price.\(^6\)

Poultry meat also has an AVE of 42% in Kenya, whereas edible oils, another important staple, have an AVE of 29.5%. In Uganda, the AVE on edible oils is 29.3%. The case of edible oil in Uganda is one where import competition issues are at the center of the policy debate. A web site recently reported that

“Edible oil producers through their umbrella organization, the Uganda Oil Producers and Processors Association (UOSPA) have appealed to government to introduce protectionist measures against imported varieties, which they say come from subsidized sources that rendered local products less competitive.”\(^7\)

Beyond alleged subsidies in Malaysia (a major source of edible oil imports), domestic producers complained about common issues—subsidies tilted toward the dominant domestic producer, Mukwano, difficult access to land for expansion, and high electricity prices.

In South Africa, NTMs on potatoes\(^8\) have a whopping 64.35% AVE, on account of a restrictive (non-automatic) licensing system.

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**Concluding Remarks**

Our results are very preliminary and should be interpreted with many caveats, the first and foremost being that the degree of disaggregation of the product nomenclature on which we base our AVE calculations is much too coarse to match the degree of disaggregation of the NTM database. This is an area where further, systematic data collection is urgently needed.

There is also a need to make progress with some of the technical issues relating to the way that the estimates of AVEs are derived, in particular, the way that NTMs are linked to prices.

Analytically, clearly more research is needed to improve the identification strategy, as the choice of instrumental variables is limited given the data at hand and the political-economy literature gives little guidance in terms of functional forms linking NTM to prices (most of the literature links tariffs to import levels).

This said, given the data limitations, results are surprisingly precise and robust. They also corroborate the factual analysis of Gillson 2011) and Charalambides and Gillson (forthcoming). Whereas SPS measures are generally those with the strongest rationale in terms of addressing potential market failures, in Sub-Saharan Africa they seem to be designed and implemented in a way that makes them cumbersome and costly. Indeed, our estimation suggests that they raise the price of foodstuffs by anything between 15% and 20-25%, a range that makes these effects non-trivial for poor households.

This of course does not mean that SPS measures should be abolished, but rather that they deserve policy attention in terms of improving design and

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\(^8\) Potato importers into South Africa must obtain a licence from the Director General of Agriculture, Marketing and Administration and a permit from the Directorate of Plant and Quality Control. They also fetch a 30% MFN tariff (7.5% from the E.U. and tariff-free from SADC). Potato production is very important in South Africa, although it is also a substantial import item (from, inter alia, Argentina and Egypt), accounting for 15% of imports of processed fruit, vegetables and agri-food other products (ITC 2010).
simplifying implementation. In view of the ample experience on the ground, the direction of improvement is clear: Systematic inspections should be replaced by risk profiling (on this, see Grigoriou forthcoming), paperwork should be simplified and consolidated into single forms made available online, and when testing is strictly necessary, it should as much as possible be outsourced to competent labs.

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References


policy’s new frontier; Washington, DC/London: The World Bank/CEPR.


Imani Development (2009), Non-tariff barrier impact study for COMESA region; mimeo


USDA (2010), EAC Rice Import Tariffs and Food Security; GAIN report # [no number]