Is there a trade-off between NTMs and Tariff protection in Mediterranean countries?

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Abstract
Resulting from the reduction of tariffs, the significance of and the interest in the impact of Non-Tariff Measures on agricultural trade has increased. The aim of this paper is to analyze the relationship between NTMs and tariffs in Mediterranean (MED) countries. A product-by-product taxonomy combining the two measures was created, and later a statistical analysis between them was applied. We identified an overall relatively low level of protection. Our findings indicate that there are dynamic substitution statistical relationships between NTM and tariffs, although with big variations across goods and countries, which gives room to ongoing efforts of harmonization in the area of agricultural trade.

Key words
Non Tariff Measures; Mediterranean Countries; agri-food trade.

1. Introduction
Trade negotiations at multilateral and regional levels are pushing down tariff rates in agricultural trade. As countries increasingly reduce tariff rates, Non-Tariff Measures (NTMs) become more important in determining agricultural trade. Recent research has clearly illustrated the trade restrictiveness of NTMs (Hoekman and Nicita, 2008; Lloyd et al., 2009; Manole and Spatareanu, 2010). Von Lampe and Jeong (2013) compare the treatment given to Sanitary and Phytosanitary measures (SPS) and Technical Barriers to Trade (TBT) rules in three Regional Trade Agreements with the WTO framework, with the underlying hypothesis that those regulations potentially hinder trade.

Relations between NTMs and tariffs have been subject to controversy. Kee et al., (2009) suggested a possible trade-off between tariff and non-tariff barriers. They argue that tariff reduction could be balanced by NTMs in order to optimise trade protection. This raises the question if tariff and NTMs act as substitute or complementary, in both cases having an impact on domestic political economic pressures (Bown and Tovar, 2009). The evidence is not conclusive as the restrictiveness of NTM might depend on the sector or the country income (Dean et al., 2009).

In the framework of trade policies aiming at a gradual opening of their agricultural markets, MED countries1 are aiming at the consolidation of a deep and comprehensive free trade area (DCFTA) in the region. As a part of this integration process, MED countries are in different stages of harmonization of their NTMs (Gonzalez-Mellado et al., 2010; Rau and Kavallari, 2013). For this reason, providing knowledge and fostering better harmonization of NTM in the Mediterranean area may foster trade rather than restricting it. In this political framework the question arises on the possible trade-off between tariff and NTMs.

2. Methods and data

1Throughout the paper the term MED countries is used, since other usual terms such as MENA (Middle East and North Africa) countries or MPC (Mediterranean Partner Countries) do not fit to our purposes for different reasons: MENA encompass much more countries than covered in this study, and MPC has a “Eurocentric” perspective not suitable here.

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The countries studied have been Egypt, Jordan, Morocco and Tunisia, and the products include the whole range of agri-food products at the 6-digit level of the Harmonized System (HS chapters 01 to 22). The protection provided by the NTMs is collected from the data on ad valorem equivalents of Non-Tariff Measures (labelled from now on as Non-Tariff Equivalents NTEs) which were estimated by Kee et al., (2009). NTEs are expressed as percentage of the value of the product, which make them directly comparable with tariffs. Most Favoured Nation (MFN) applied tariffs at HS 6-digit were collected from the World Integrated Trade Solution (WITS) database, corresponding to the same periods as the NTE were available. The number of tariffs lines considered in this study includes over 500 products. Once the data were collected, the trade protection pattern considering both NTMs and tariffs has been studied for each country in two different ways. First, we create a “taxonomy” of trade protection. Second, we test whether NTEs are statistically dependent upon tariffs. In order to create the taxonomy we have selected the NTE and tariff peaks. We identified as NTE and tariff peaks those values greater than 0.75 per cent. To define such peaks, the modalities document prepared by the Committee of Agricultural Negotiations circulated in the Doha current negotiations (WTO, 2008) was taken into consideration. Then, we classified the implementation into four categories:

- High protection: The first category contains all products where tariffs are relatively high (above 75 per cent) and also high NTMs are applied (NTEs greater than 75 per cent).
- Disguised protection: The second category contains all products where tariffs are relatively low (less than 75 per cent) but high NTMs are applied (NTEs greater than 75 per cent).
- Low protection: The third category contains all products where tariffs are relatively low (less than 75 per cent) and also low NTMs are applied (NTEs below 75 per cent).
- Transparent protection: The fourth category contains all products where tariffs are relatively high (above 75 per cent) but low NTMs are applied (NTEs below 75 per cent).

A second in-depth analysis has been carried out for each country in the group through a set of multiple regression analyses. It focal purpose is to test whether there is a trade-off between NTE and tariffs or not. The equation (1) depicts the regression made.

\[
\ln NTE = \alpha + \beta_1 \ln T + \beta_2 \Delta \ln T + \sum \delta_j Z_j + \sum \sigma_k Z_k \ln T + \sum \rho_l Z_l \Delta \ln T + \sum \gamma_m f_m \quad (1)
\]

Where \(\ln NTE\) are the natural logarithm of ad valorem equivalents of the NTMs, \(\ln T\) the natural logarithm of the tariffs, which are calculated as a simple average for the products included under each 6 digit heading. With \(\Delta\) we mean the five year differences between the

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2These countries are members of the WTO, part of the Euro-Mediterranean partnership, and signatories of the Agadir Agreement, among other bilateral agreements. Thus, they are in a process of trade liberalization that goes beyond the multilateral agreements.

3The bilateral tariff commitments that are being implemented within regional agreements are left for future studies, considering that the multilateral MFN rates can be more stable than bilateral rates, in particular, during transition periods in bilateral trade liberalizations, or during periods of economic crisis when anti-dumping measures may be frequent (Kee et al., 2013).

4R-language in multiple regression analysis was used. See: http://www.r-project.org/

5It may be worthwhile to stress that the aim of the regression is not predictive regarding the level of NTE –which would eventually require a more complete specification- but to estimate the effects and interdependences described in the main text.
logarithms of the tariffs, being the final year the year for which NTEs were available. Specific chapter effects $Z_j$ are represented through dummies that represent the fixed effects for groups of products (see Dean et al. 2009), which are defined as belonging to Section I -live animals and animal products, HS chapters 01 to 05, $k = 1$ - and Section II -vegetal products, chapters 06 to 14, $k = 2$. Finally, $f_m$ is a set of dummy variables being equal to 1 when the product belongs to HS chapter $j$ and 0 otherwise.

If $\ln \text{NTE}$ and $\ln T$ were correlated, we expect a positive and statistically significant coefficient in both variables. That would involve certain difficulties as NTMs could remain as an obstacle for tariff reductions undertaken at multilateral level or in the preliminary steps of the trade liberalization processes. If tariffs and NTMs are not correlated, we expected opposites signs. In this case, the harmonization and/or removal of NTMs could be rather connected with specific negotiations on SPS and TBT issues and with technical aspects that would possibly be less affected by political economy considerations.

In addition, apart from the static variation, notice that considering the $\Delta \ln T$, we also can observe the dynamic correlation. Finally, considering tariff variation allows us to deal with endogeneity between NTEs and tariffs.

3. Results and discussion

For the four MED countries considered, the taxonomy is illustrated, below in Table 1. The table shows that a significant number of products can be considered as receiving a transparent or low protection levels.

Table 1. Taxonomy of agricultural trade protection (Percentage of products in each category).

<table>
<thead>
<tr>
<th>Category</th>
<th>Egypt</th>
<th>Jordan</th>
<th>Morocco</th>
<th>Tunisia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Highest frequency chapter</td>
<td>%</td>
<td>Highest frequency chapter</td>
</tr>
<tr>
<td>High</td>
<td>1</td>
<td>22</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Disguised</td>
<td>26</td>
<td>08</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>Transparent</td>
<td>1</td>
<td>22</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>Low</td>
<td>71</td>
<td>03</td>
<td>95</td>
<td>03</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Disguised protection is significant in Morocco, Tunisia and Egypt if thresholds are set at 0.75 per cent, ranging from 19 percent of total products in Tunisia to 26 percent in Egypt. This indicates that, in spite of the criterion for setting the level of tariff peaks, the NTE keep a protective role in a significant number of cases. Jordan shows a low protection level, irrespective of the criteria set. It does not have products in the high protection group, and the percentage of products in the disguised group is only 4 percent. In Egypt, the high protection group keeps at only 1 percent of total products with the same thresholds but the disguised protection group still represents 26 percent. As a conclusion, data on tariff and NTE show that (i) high NTE are still significant in several MED countries and (ii) high NTE appear in products with relatively high and products with relatively low tariff levels.
To investigate further on the relationships between NTE and tariffs, the OLS regression model presented in equation (1) was estimated, and its results are summarized in Table 2.

**Table 2.** Model results. Dependent variable Non-Tariff Equivalents of Non-Tariff Measures

<table>
<thead>
<tr>
<th>Ln Tariff</th>
<th>Egypt</th>
<th>Lebanon</th>
<th>Jordan</th>
<th>Morocco</th>
<th>Tunisia</th>
<th>Algeria</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_1 \ln T$</td>
<td>-0.0506</td>
<td>-0.3552</td>
<td>2.5739</td>
<td>0.6373</td>
<td>0.1251</td>
<td>-0.1696</td>
</tr>
<tr>
<td>(0.0542)</td>
<td>(0.2637)</td>
<td>(1.6300)</td>
<td>(0.3248)</td>
<td>(0.2791)</td>
<td>(0.4946)</td>
<td></td>
</tr>
<tr>
<td>$x$ Animal Products</td>
<td>-0.4896</td>
<td>0.6256</td>
<td>-3.2506</td>
<td>-0.6922*</td>
<td>0.0123</td>
<td>0.1284</td>
</tr>
<tr>
<td>(Chapters 1 to 5)</td>
<td>(0.3338)</td>
<td>(0.6587)</td>
<td>(1.6688)</td>
<td>(0.3422)</td>
<td>(0.1420)</td>
<td>(0.6995)</td>
</tr>
<tr>
<td>$\sum \sigma_k Z_k \ln T$</td>
<td>2.5739</td>
<td>0.6373</td>
<td>-0.1251</td>
<td>0.1284</td>
<td>0.1284</td>
<td>0.8738</td>
</tr>
<tr>
<td>(1.6300)</td>
<td>(0.3248)</td>
<td>(0.2791)</td>
<td>(0.4946)</td>
<td>(0.6995)</td>
<td>(0.5505)</td>
<td></td>
</tr>
<tr>
<td>$\Delta$ Ln Tariff</td>
<td>0.1800</td>
<td>0.2079</td>
<td>-0.1605</td>
<td>-0.0236</td>
<td>0.2220</td>
<td>-0.7192**</td>
</tr>
<tr>
<td>$\beta_2 \Delta \ln T$</td>
<td>(0.1964)</td>
<td>(0.2123)</td>
<td>(1.4900)</td>
<td>(0.1268)</td>
<td>(0.3357)</td>
<td>(0.3146)</td>
</tr>
<tr>
<td>Animal Products</td>
<td>0.0370</td>
<td>-0.3892</td>
<td>1.1539</td>
<td>-0.2321</td>
<td>0.9064</td>
<td></td>
</tr>
<tr>
<td>(Chapters 1 to 5)</td>
<td>(0.3240)</td>
<td>(0.5948)</td>
<td>(1.7184)</td>
<td>(0.2679)</td>
<td>(0.4661)</td>
<td></td>
</tr>
<tr>
<td>$\sum \rho_l Z_l \Delta \ln T$</td>
<td>-0.8615***</td>
<td>-0.0810</td>
<td>-0.2347</td>
<td>-0.8493***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable Products</td>
<td>(0.3276)</td>
<td>(0.5064)</td>
<td>(0.3503)</td>
<td>(0.2803)</td>
<td>(0.4167)</td>
<td></td>
</tr>
<tr>
<td>(Chapters 6 to 14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\nabla$ observations</td>
<td>532</td>
<td>545</td>
<td>75</td>
<td>583</td>
<td>467</td>
<td>568</td>
</tr>
<tr>
<td>p-value</td>
<td>0.04936</td>
<td>0.01045</td>
<td>0.01611</td>
<td>4.651e-05</td>
<td>1.009e-05</td>
<td>0.000105</td>
</tr>
</tbody>
</table>

Notes: ***, **, * indicate significance at 1, 5 and 10 per cent, respectively. Standard errors are provided in brackets. The coefficients of the fixed effects are omitted for reasons of space, as the relevant information is the level of significance and the HS chapters affected. Source: Authors’ calculations.

According to the preliminary results (Table 2), for the relationship between NTEs and tariff levels, in Jordan and Lebanon, no significant effects on substitution or complementarity were found. In Egypt, Tunisia, Algeria and Morocco, dynamic policy substitution takes. Static substitution is only significant for vegetal products in Morocco; therefore, it indicates that the restrictiveness of NTMs is determined by the evolution of tariffs, rather than its current level.

However, no general pattern was found on the product significance of NTEs, in Algeria dynamic substitutability applies to all the HS sections, while Egypt and Tunisia apply it at vegetable products, and Morocco only at animal products.

### 4. Concluding remarks.

As tariffs follow an overall reduction pattern, the purpose of this research was to determine the actual level of protection. Once this is made, the subsequent step is to determine the means for achieving protection. There are different possibilities at stake: One possibility is only-tariff protection. Another possibility is to use NTMs as a substitute for tariffs. A third possibility is that significant NTMs coincide with tariffs.
A taxonomy of the products has been made, considering simultaneously the protection via tariffs and via NTMs. The dominant category observed is low protection. However, the general picture shows that still remains a relatively high level disguised protection (low tariffs and relatively high NTEs) in the four countries considered. Nevertheless, there are countries differences. The next step in the analysis has been to explore if there is a trade-off between NTMs and tariffs. In the results we observed that policy substitution takes place in a dynamic way in Egypt, Tunisia, Algeria and Morocco.

However, these results suggest that the protection described above does not respond to a general logic of relationship between NTEs and tariff levels. Furthermore we conclude that the analysis requires further exploration at the country level.

References


World Trade Organization (WTO) 8, February 2008: Revised draft modalities for agriculture, Committee on Agriculture Special Session. TN/AG/W/4/Rev.1, Geneva.