PRONTO Annual Conference:
Quantifying Non-Tariff Barriers to Trade and Investment

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Assessing the Impact of Non-Tariff Measures on Imports

Julia Grübler (with Mahdi Ghodsi and Robert Stehrer)

This paper was produced as part of the PRONTO (Productivity, Non-Tariff Measures and Openness) project funded by the European Commission under the 7th Framework Programme.
Ad-valorem equivalents (AVEs) of NTMs
or: How to make NTMs directly comparable to tariffs?

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<th>Indirect Approach</th>
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Ad-valorem equivalents (AVEs) of NTMs
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**Issues**
- Necessity to compare different prices along the production and supply chain
- Neglect of product quality differences
- Price data availability usually restricts to few countries for a small set of products
- Based on import demand elasticities, which are themselves estimates
- Neglect of product quality differences

- New data set (WTO I-TIP complemented by Ghodsi et al, 2015)
- Types of NTMs
- Intensity Measure for NTMs
- Using a panel structure
Methodology

- Heckman two-stage estimation procedure:

\[
\text{Prob}[m_{ijht} > 0] = \alpha_0 + \alpha_1 \ln(1 + t_{ijht}) + \sum_n \alpha_2 n \cdot NTM_{nijht} + \alpha_3 C_{ijt} + \omega_i + \omega_j + \omega_t + \epsilon_{ijht}, \]
\[
\forall h; \ n \in \{ADP, CVD, SG, SSG, SPS, TBT, QRS; STC_{SPS}, STC_{TBT}\}
\]

\[
\ln(m_{ijht}|m_{ijht} > 0) = \beta_0 + \beta_1 \ln(1 + t_{ijht}) + \sum_{n=1}^{N-1} \beta_2 n \cdot NTM_{nijht} + \sum_{i=1}^{I} \beta_{2n'i} \cdot \omega_{i} \cdot NTM_{n'iijht} + \beta_3 C_{ijt}
\]
\[
+ \omega_{ij} + \omega_{t} + \phi_{ijht} + \mu_{ijht},
\]
\[
\forall h; \ \forall n, n' \in \{ADP, CVD, SG, SSG, SPS, TBT, QRS; STC_{SPS}, STC_{TBT}\} \text{ where } n' \neq n
\]

- Transformation to AVEs:

\[
\frac{\partial \ln(m_{ih})}{\partial NTM_{i_{ih}}} = \frac{\partial \ln(m_{ih})}{\partial \ln(p_{ih})} \frac{\partial \ln(p_{ih})}{\partial NTM_{i_{ih}}} = \varepsilon_{ih} AVE_{i_{ih}}^n
\]

\[
AVE_{i_{ih}}^n = \frac{e^{\beta_{2n'i}} - 1}{\varepsilon_{ih}}
\]
Note: Total of 37,982 NTM notifications over the period 1979 to March 2015; Graph excludes 899 Specific Trade Concerns.
Note: Mean binding AVEs (i.e. statistically different from zero at the 10% level) computed as simple averages over all observations for two samples: (a) the full sample and (b) excluding intra-EU trade in the estimation.
NTMs by income

Note: Figures on countries affected exclude all NTMs that apply to all exporters. Income group classification of the World Bank.
NTMs by income *vs.* average AVEs

<table>
<thead>
<tr>
<th>Income Group</th>
<th>SPS</th>
<th>TBT</th>
<th>QRS</th>
<th>ADP</th>
<th>OCA</th>
<th>STC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income</td>
<td>32.6</td>
<td>5.0</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Lower middle income</td>
<td>11.9</td>
<td>7.5</td>
<td>.</td>
<td>-4.0</td>
<td>-5.6</td>
<td>14.4</td>
</tr>
<tr>
<td>Upper middle income</td>
<td>12.1</td>
<td>5.8</td>
<td>-4.7</td>
<td>-9.6</td>
<td>67.4</td>
<td>11.3</td>
</tr>
<tr>
<td>High income</td>
<td>9.1</td>
<td>4.0</td>
<td>38.6</td>
<td>-17.5</td>
<td>13.9</td>
<td>-5.4</td>
</tr>
</tbody>
</table>

**Note:** Income classification of the World Bank
NTMs by Product

- Live animals and products
- Vegetable products
- Prepared foodstuff; beverages, spirits, vinegar; tobacco
- Products of the chemical and allied industries
- Machinery and electrical equipment
- Resins, plastics and articles; rubber and articles
- Base metals and articles
- Animal and vegetable fats, oils and waxes
- Mineral products
- Vehicles, aircraft and vessels
- Miscellaneous manufactured articles
- Instruments, clocks, recorders and reproducers
- Textiles and articles
- Articles of stone, plaster; ceramic prod.; glass
- Wood, cork and articles; basketware
- Paper, paperboard and articles
- Hides, skins and articles; saddlery and travel goods
- Footwear, headgear; feathers, artif. flowers, fans
- Arms and ammunition
- Works of art and antiques
- Pearls, precious stones and metals; coin
NTMs by Product vs. simple average AVEs

Note: $A\bar{V}E_{HS2} = \sum \frac{\sum_{H_i} A\bar{V}E_{th}}{H_{th}} / I$
NTMs by Product vs. import-weighted average AVEs

Note: \( AVE_{HS2} = \frac{\sum_{i} AVE_{ih} \cdot Import_{ih}}{Import_{i,HS2}} \)}
## NTMs by Product: EU Exports vs. US AVEs

<table>
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<tr>
<th>HS2</th>
<th>EU Exports</th>
<th>US AVEs</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>World Exports</td>
<td>Rank: World</td>
</tr>
<tr>
<td>84</td>
<td>388.0</td>
<td>1</td>
</tr>
<tr>
<td>87</td>
<td>220.0</td>
<td>2</td>
</tr>
<tr>
<td>85</td>
<td>194.0</td>
<td>3</td>
</tr>
<tr>
<td>27</td>
<td>146.0</td>
<td>4</td>
</tr>
<tr>
<td>30</td>
<td>129.0</td>
<td>5</td>
</tr>
<tr>
<td>90</td>
<td>93.0</td>
<td>6</td>
</tr>
<tr>
<td>71</td>
<td>72.5</td>
<td>7</td>
</tr>
<tr>
<td>29</td>
<td>63.2</td>
<td>8</td>
</tr>
<tr>
<td>39</td>
<td>60.1</td>
<td>9</td>
</tr>
<tr>
<td>88</td>
<td>53.1</td>
<td>10</td>
</tr>
</tbody>
</table>

Note: HS 2-digits computed as simple average over HS 6-digit products. Ranks are based on all products for which at least one NTM applied.
## NTMs by Product: US Exports vs. EU AVEs

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<td>27</td>
<td>131.0</td>
<td>3</td>
</tr>
<tr>
<td>87</td>
<td>120.0</td>
<td>4</td>
</tr>
<tr>
<td>90</td>
<td>79.4</td>
<td>5</td>
</tr>
<tr>
<td>71</td>
<td>71.8</td>
<td>6</td>
</tr>
<tr>
<td>39</td>
<td>59.1</td>
<td>7</td>
</tr>
<tr>
<td>29</td>
<td>45.7</td>
<td>8</td>
</tr>
<tr>
<td>30</td>
<td>38.1</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>28.3</td>
<td>10</td>
</tr>
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Note: EU aggregate computed by applying import weights at the HS 6-digit level. HS 2-digits computed as simple average over HS 6-digit products. Ranks are based on all products for which at least one NTM applied.
Data limitations
shown with import-weighted AVEs of SPS measures and TBTs, sign. at 10%
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Literature


