Overview of the aggregate data collection and effects of NTMs

Selected findings from the NTM-IMPACT project

NTM-IMPACT Consortium
Presented by Christine Wieck

Organized Session
NTMs, Agricultural and Food Trade, and Competitiveness
Findings from the NTM-IMPACT Project
Objective: Collection and analysis of NTMs for EU, food-exporting EU-competitor countries, and impacts for LDCs

Work groups focusing on:

- Analytical framework for definition of measures, products, time frame, and methods
- Public agri-food regulations across 11 countries
  - Compilation of database with regulations
  - Comparative analysis of regulatory heterogeneity
  - Trade impact of NTMs using gravity model
- Private and public standards addressed in case studies
  - On meat, dairy, F&V NTMs and trade impacts for EU and competitor countries
  - On impacts for LDCs
Brings together 19 partners from 16 countries
  - Coordinator: G. Henry (CIRAD, France)
  - France, Netherlands, Germany, Belgium, UK, Slovak Rep.
  - US, Canada, Argentina, Brazil, India, Russia, China, Australia, New Zealand, Japan

Outreach supported by IPC

Co-financed by the European Commission

Project web site: http://www.ntm-impact.eu
Outline

- Project components:
  - Analytic framework for defining measures and methods
  - Construction of a new NTM database for agri-food trade
  - Measuring regulatory heterogeneity using index
  - Analysis of the trade impact of NTMs using the new database
  - Analysis of the impact of NTMs on product trade clusters
  - Analysis of the impact of private and public standards on LDCs
New NTM database on public regulations

- Eight product groups identified where EU countries have a considerable export interest
  - Beef, pork meat, cheese, barley, maize, rape, and some F&V
- 10 regions (+ India)
- One snapshot in time: 2010

- Related papers:
New NTM database on public regulations

- 10 categories of measures considered

<table>
<thead>
<tr>
<th>Numerical measures</th>
<th>Qualitative measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticide maximum residue levels</td>
<td>Labeling requirements</td>
</tr>
<tr>
<td>Veterinary drugs maximum residue levels</td>
<td>Plant health measures</td>
</tr>
<tr>
<td>Microbiological levels</td>
<td>Animal health measures</td>
</tr>
<tr>
<td>Contaminant levels</td>
<td>Traceability requirements</td>
</tr>
<tr>
<td>Additives</td>
<td>Conformity assessment</td>
</tr>
</tbody>
</table>

- Classification of measures in line with MAST classification
## Database contributors

<table>
<thead>
<tr>
<th>Region</th>
<th>Data collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union</td>
<td>Dutch Agricultural Research Institute (LEI), Slovak Agricultural University</td>
</tr>
<tr>
<td>Argentina</td>
<td>Instituto Nacional de Tecnologia Agricola</td>
</tr>
<tr>
<td>Australia</td>
<td>University of Sydney</td>
</tr>
<tr>
<td>Brazil</td>
<td>University of Sao Paulo</td>
</tr>
<tr>
<td>Canada</td>
<td>Université de Laval</td>
</tr>
<tr>
<td>China</td>
<td>Centre for Chinese Agricultural Policy</td>
</tr>
<tr>
<td>Japan</td>
<td>Osaka University &amp; Keio University</td>
</tr>
<tr>
<td>New Zealand</td>
<td>University of Otago</td>
</tr>
<tr>
<td>Russia</td>
<td>Institute for Agricultural Market Studies</td>
</tr>
<tr>
<td>United States</td>
<td>Virginia Tech University</td>
</tr>
<tr>
<td>Codex, OIE</td>
<td>University of Bonn, LEI</td>
</tr>
</tbody>
</table>
Database features

- For numerical measures (e.g. MRLs): use of existing data (EU, USDA, …)
- Qualitative measures: specific online questionnaires with associated keywords
- Logbooks & commenting stored in database
- Stored in MS Access
- Link to EU Market Access Database foreseen
Example: # of pesticides in countries + Codex

ARG AUS BRA CAN CHN COD EU JAP NZL RUS USA

Tomatoes
Rapeseed
Potatoes
Porkm.
Pears
Maize
Cheese
Beef
Peppers
Barley
Eggplant
Apples

# of pesticides in countries
Example: traceability questionnaire

5. Does your country have a mandatory system for traceability?
   • For Beef products
   • For Pork products
   • For Fruit products
   • For Vegetable products
   • For Cereal products
   • For Dairy products

6. Which parts of the supply chain need to be recorded (not necessarily in paper form)?
   Check one or more of the appropriate boxes
   • One step towards the consumer
   • One step towards the previous supplier
   • Two steps towards the consumer
   • Two steps towards the previous supplier
   • The whole supply chain
   • No traceability requirements

7. Do your country's traceability requirements cover:
   • Agricultural production inputs (feed)
   • Agricultural production inputs (not feed but e.g. fertilizer)
   • Transport intra business
   • Veterinary medicine products
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Measuring heterogeneity in NTMs

- Measurement and comparability of NTMs is often difficult, particularly for non-numerical standards
- Quantification of differences in NTMs across countries using an index: Heterogeneity index of trade (HIT)
- HIT facilitates aggregation of diverse regulations involving different kinds of information
  - Including binary, ordered, and quantitative data

- Related paper:
Comparing different types of measures

<table>
<thead>
<tr>
<th>Type of measure</th>
<th>Binary</th>
<th>Ordered</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rule based calculation</td>
<td>Rank based qualitative or quantitative information</td>
<td>Numerical elements</td>
</tr>
<tr>
<td>Example</td>
<td>EU regulates (1) and</td>
<td>EU imposes the tightest labeling requirements (5), US is average (3)</td>
<td>Maximum residue levels of a specific substance for a specific product</td>
</tr>
<tr>
<td></td>
<td>Australia does not</td>
<td>and Mexico has the most lenient requirement (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>regulate (0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Organized Session: Findings from the NTM-IMPACT Project
(Dis-)similarity of specific measures

- Gower index (1971) is used
- => Bilateral comparison of regulations regarding similarity
- => (Weighted) aggregation of bilateral similarity to overall index (HIT)
  - For specific classes of regulations (e.g. pesticide MRLs, or traceability)
- Characteristics of the index (HIT):
  - Overall index (HIT) is bounded between zero (identical regulations) and one (maximum dissimilarity)
  - HIT is bilateral and specific wrt to trade direction
- Allows to „slice“ the data in every direction
Traceability requirements for apples: comparison across countries

HIT for exports of CHN into US
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Analyzing the impact of heterogeneity on trade flows

- Specification of gravity models that include these heterogeneity index
- Bilateral trade between EU27, Argentina, Australia, Brazil, Canada, China, Japan, New Zealand, Russia, and the US

Related paper:

Gravity analysis specification

\[ \ln x_{ij} = \alpha_0 + \ln prod_i + \ln prod_j + \alpha_i + \alpha_j + \delta D_{ij} + \epsilon_{ij} \]

where

- \( x_{ij} \) is the log of exports from \( i \) to \( j \) (HS6 product level)
- \( prod \) is log of production in region \( i \) and \( j \) (HS6)
- \( \alpha \) are exporter and importer fixed effects
- \( D_{ij} \) is a matrix of trade cost determinants (distance, applied tariffs (HS6), language, HIT)

Different groupings of products tried: meat, cereals, F&V, plant, animal

Different estimation methods used (OLS, PPML, HMR, 2-stage Heckman)
Gravity analysis specification

- Up to 13 heterogeneity indexes included
  - Additives, contaminants, pesticide MRLs, veterinary drugs MRLs
  - Traceability, product, process, plant, veterinary, monitoring, certification & labeling requirements
  - Conformity assessment requirements
### Results

<table>
<thead>
<tr>
<th>Product level</th>
<th>Method</th>
<th>Dependent variable</th>
<th>Number of observations</th>
<th>DISTANCE</th>
<th>PRODUCTION EXPORTER</th>
<th>COMMON LANGUAGE</th>
<th>APPLIED TARIFF</th>
<th>ADDITIVES</th>
<th>CERTIFICATION</th>
<th>PLANT REQUIREMENTS</th>
<th>PESTICIDE MRLS</th>
<th>CONTAMINANTS</th>
<th>LABELLING</th>
<th>CONFORMITY ASSESSM.</th>
<th>APPL. TARIFF x LABELLING</th>
<th>APPL. TARIFF x PLANT REQU.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant products</td>
<td>PPML</td>
<td>Trade flow</td>
<td>2625</td>
<td>-0.68***</td>
<td>0.49***</td>
<td>-1.54*</td>
<td>-0.2**</td>
<td>0.33***</td>
<td>1.27***</td>
<td>1.12**</td>
<td>-1.29***</td>
<td>-0.36***</td>
<td>-1.31***</td>
<td>-1.36*</td>
<td>1.05***</td>
<td>-1.20**</td>
</tr>
</tbody>
</table>

- Not significant:  
  - Traceability  
  - Monitoring  
  - Constant  
  - Importer production
Conclusions

- NTM database collected under the NTM-IMPACT project provides a rich dataset for future analysis.
- Aggregation of NTMs using heterogeneity indices provides new impetus for comparisons across country pairs and products of NTMs.
- The current definition of regulatory heterogeneity may need further improvement.
  - => Considering stringency and/or costs of compliance.
- The trade impacts of heterogeneity of regulations across products and aggregation levels are still difficult to identify.