New Results from Process Standards Data

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The Good, the Bad and the Ambiguous: Standards and Trade in Agricultural Goods with the EU

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Some Personal Experience …
What can we learn from that?

- Countries have differing product / process specifications which help to characterize the technical and economic environment of a country.

- Some sort of product adaptation may be required to operate goods in a different country.

- Precise information about the technical environment is required to properly adapt the product to the foreign market.
“The use of product standards ... as a means of denying market access to foreign suppliers is the most important issue in international merchandise trade policy today.

Robert G. Hawkins
The Prevailing View

- **The Good**: Internationally harmonized standards remove trade-barriers

- **The Bad**: Country-specific standards create trade barriers

- **The Asymmetric**: Country-specific standards of large countries are less of a barrier, since adaptation costs are a fixed cost.
Types of Standards

Importing Country B

Exporter Standards

Exporting Country A

Specific | Shared

Shared | Specific

Exports
My Previous Findings (Moenius 2002)

- Created a data-set of 14 countries, 16 years, 471 SITC industries for shared as well as country-specific standards
- Estimated effect of standards on trade-flows with large sample gravity-regression
- Found that:
  - Shared standards promote trade
  - Importer standards hinder trade for simple goods
  - Importer standards promote trade for complex goods
• Shared Standards **remove** barriers

• Importer standards …
  …**are a barrier** relative to **shared** standards
  …**can reduce barrier** relative to **no** standards:
  – Lower search costs
  – Lower product adaptation costs through exact knowledge of specification
  – Lower variety, fewer specifications to adapt to

• **Trade-off**: Second effect dominates for complex goods
Question:

The US blames the EU for blocking market access with standards and vice versa.

– Is that (statistically measurably) true in general?

– Specifically, is it true for agricultural goods?

– And if yes, is this true for all standards, all agricultural products and at all times?
My Approach:

- Large sample gravity equation

- Data on bilaterally shared and country-specific standards for 471 industries (80 agriculture), 15 countries for 1980-1995

- Estimate results for bilateral trade relationships between US, some EU and some non-EU countries.
My Answers

- On average, same as in my previous work: country-specific standards hinder trade in simple goods and promote trade in complex goods, but strength of the effect varies by country and industry.

- On average, EU standards seem to hinder trade in agricultural products.

- This effect varies widely by agricultural industry: even in some agricultural products, it seems that the effects are rather positive.

- There is a tendency towards stronger barrier effects of EU agricultural standards during the sample period.
My Explanation:

- **The Good**: Standards of any kind, if reliably enforced, reveal **information** about the technical and economic environment of a country → costless, public good

- **The Bad**: Country-specific standards create trade **barriers**: product adaptation costs, costs of process changes, testing costs → born by private parties

- **The Ambiguous**: **Harmonization** reduces product adaptation costs but also may reduce variety. Informational value may be small → overall effect may be **negative**
The Trade-Offs

Adaptation Cost

Information-Provision

Country-Specific

Harmonized

Variety-Reduction
My Contribution:

• **Econometric analysis** of the effects of standards in agricultural industries on Trade-Flows

• Identify which of the three effects dominate for **80 agricultural industries** over time

• Identify which of the three effects dominates for **EU-standards**
Outline of the Presentation

- Introduction
- Theoretical Framework
- Empirical Specification
- Estimation Results
- Summary
Some Definitions:

Standards are

• Product and process specifications
• They harmonize the treatment of intermediates or attributes of final goods
• Three types: de facto, de jure and institutional standards
• Here: institutional standards only (TRs not included)

My measure of shared standards:

• Links between documents
Links between Documents:
Previous Research-Overview:

• Literature on standardization and trade has been growing over the last few years, largely sponsored by the World Bank and the DIN-Institute.

• General Literature on Non-Tariff-Barriers (NTBs) helpful

• The theoretical literature provides no clear prediction
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The Gravity Model:

\[
\text{Bilateral Trade Volumes} = f(\text{Economic Masses, Distance, Other Factors})
\]

Economic Masses, Distance: country-pair specific  
Other Factors  
\[
\begin{align*}
\text{Country 1} & \quad \text{Economic Mass} & + \\
\text{Country 2} & \quad \text{Economic Mass} & + \\
\hline
\text{Distance} & & -
\end{align*}
\]

Fixed Effects

\[
\begin{align*}
\text{country-pair-specific} & & \text{industry-specific}
\end{align*}
\]
Import Equations:

\[ \ln(IM_{ijkt}) = \alpha + \beta_1 \ln(SST_{ijkt}) + \beta_2 \ln(CSTE_{jkt}) + \beta_3 \ln(CSTI_{ikt}) + F_{ijt} + \varepsilon_{ijkt} \]

\(IM_{ijkt}\) dollar value of imports into country \(i\) from country \(j\)

SST shared standards

CSTE country-specific standards of exporting country

CSTI country-specific standards of importing country

\[ \ln(IM_{ijkt}) = \alpha + \beta_1 \ln(SST_{ijkt}) + \beta_2 \ln(CSTE_{jkt}) + \beta_3 \ln(CSTI_{ikt}) + D_{kt} + F_{ij(2k)t} + \varepsilon_{ijkt} \]

D dummy-variable

2k 2 - digit SITC
Data-Description:

- **Sources:**
  - Trade data: World Trade Database
  - Standards Data: filtered from PERINORM (DIN, AFNOR, BSI)
  - (National accounts and exchange rates: IMF)

- **Specifics**
  - 471 SITC industries
  - Countries: Japan, Austria, Australia, Belgium, Switzerland, Germany, Spain, France, UK, Netherlands, Norway, Poland, Turkey, US
  - Annual: 1980-1995
## Country-Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Countries (Comments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>(Incomplete Data-Set)</td>
</tr>
<tr>
<td>EU</td>
<td>Belgium, Germany, France, UK, Netherlands</td>
</tr>
<tr>
<td>Non-EU</td>
<td>Japan, Austria (‘95), Australia, Switzerland, Spain (‘86), Norway, Poland (‘04), Turkey</td>
</tr>
</tbody>
</table>
Outline of the Presentation

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<table>
<thead>
<tr>
<th>SITC</th>
<th>shared</th>
<th>importer</th>
<th>exporter</th>
<th>$R^2$</th>
<th>Observations</th>
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</thead>
<tbody>
<tr>
<td>0 Food</td>
<td>-0.13</td>
<td>-0.19</td>
<td>0.27</td>
<td>0.39</td>
<td>102,136</td>
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<tr>
<td></td>
<td>(-6.20)</td>
<td>(-13.50)</td>
<td>(19.20)</td>
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<td></td>
</tr>
<tr>
<td>1 Beverages</td>
<td>-1.35</td>
<td>-1.24</td>
<td>-0.21</td>
<td>0.41</td>
<td>12,532</td>
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<tr>
<td></td>
<td>(-16.33)</td>
<td>(-20.10)</td>
<td>(-3.59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Crude Mat.</td>
<td>-0.014</td>
<td>-0.026</td>
<td>0.10</td>
<td>0.23</td>
<td>80,824</td>
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<tr>
<td></td>
<td>(-0.95)</td>
<td>(-2.25)</td>
<td>(8.75)</td>
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<tr>
<td>3 Fuels</td>
<td>0.36</td>
<td>-0.24</td>
<td>0.43</td>
<td>0.37</td>
<td>16,538</td>
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<tr>
<td></td>
<td>(7.24)</td>
<td>(-5.55)</td>
<td>(11.88)</td>
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<td></td>
</tr>
<tr>
<td>4 Oils, Fats</td>
<td>-0.18</td>
<td>0.066</td>
<td>-0.12</td>
<td>0.36</td>
<td>9,964</td>
</tr>
<tr>
<td></td>
<td>(-1.63)</td>
<td>(1.31)</td>
<td>(-2.85)</td>
<td></td>
<td></td>
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<tr>
<td>5 Chemicals</td>
<td>0.12</td>
<td>0.19</td>
<td>0.36</td>
<td>0.55</td>
<td>70,096</td>
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<tr>
<td></td>
<td>(10.75)</td>
<td>(18.36)</td>
<td>(38.31)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Man. by Mat.</td>
<td>0.05</td>
<td>0.096</td>
<td>0.063</td>
<td>0.49</td>
<td>180,146</td>
</tr>
<tr>
<td></td>
<td>(6.72)</td>
<td>(14.07)</td>
<td>(9.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Machinery</td>
<td>0.15</td>
<td>0.24</td>
<td>0.25</td>
<td>0.61</td>
<td>133,780</td>
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<tr>
<td></td>
<td>(19.97)</td>
<td>(32.25)</td>
<td>(33.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Miscellaneous</td>
<td>0.28</td>
<td>0.084</td>
<td>0.38</td>
<td>0.57</td>
<td>106,020</td>
</tr>
<tr>
<td></td>
<td>(27.41)</td>
<td>(10.32)</td>
<td>(49.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 not elsewhere classified</td>
<td>(none)</td>
<td>-0.092</td>
<td>0.51</td>
<td>0.25</td>
<td>5,836</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-1.41)</td>
<td>(10.12)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Imports – Evaluated by Industry:

- **Simple** manufacturing industries: country-specific standards reduce imports – *trade barrier effect* dominates

- **Complex** goods: country-specific standards increase imports – *market access effect* dominates
Caveats

• Count-data does not necessarily reflect economic importance

• Strong assumption:
  – Level of protection other than through standards within each 1-digit-industry is the same
  – standards uncorrelated with other trade-barriers (tariffs, subsidies)
## Some Country-Comparisons (Imports):

<table>
<thead>
<tr>
<th>Country</th>
<th>Shared</th>
<th>Importer</th>
<th>Exporter</th>
<th>R²</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>0.74</td>
<td>-0.07</td>
<td>0.18</td>
<td>0.34</td>
<td>68,301</td>
</tr>
<tr>
<td></td>
<td>(8.95)</td>
<td>(-4.36)</td>
<td>(14.42)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>0.29</td>
<td>0.34</td>
<td>0.03</td>
<td>0.38</td>
<td>81,080</td>
</tr>
<tr>
<td></td>
<td>(25.75)</td>
<td>(37.86)</td>
<td>(2.78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.14</td>
<td>0.18</td>
<td>0.35</td>
<td>0.40</td>
<td>81,831</td>
</tr>
<tr>
<td></td>
<td>(11.00)</td>
<td>(15.31)</td>
<td>(30.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>-0.087</td>
<td>-0.40</td>
<td>0.93</td>
<td>0.21</td>
<td>54,316</td>
</tr>
<tr>
<td></td>
<td>(-4.45)</td>
<td>(-29.35)</td>
<td>(73.99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>0.25</td>
<td>0.82</td>
<td>0.15</td>
<td>0.22</td>
<td>83,959</td>
</tr>
<tr>
<td></td>
<td>(3.86)</td>
<td>(57.22)</td>
<td>(11.82)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(robust t-statistics in parenthesis)
Examples in Agriculture

• DIN 10091: Boxes for Horticulture, dimensions
• DIN 10262: Oleaginous seeds, determination of impurities
• BBA MB 27/1: Stages of development of cereals, except maize, used for tests, counseling and practice in agriculture
Comment

• Both product- as well as process- standards in agriculture

• Induce additional cost, e.g. for testing

• Provide precise information about conditions / specifications that need to be met for testing → precise Market Access Information
Agriculture: EU as Importer, Shared Standards

Period:
- 80-85
- 86-90
- 91-95

Elasticity:
- Sha EU-EU
- Sha EU-O
Agriculture: EU as Importer, Exporter Standards
## Distribution Across Industries

<table>
<thead>
<tr>
<th></th>
<th>All Countries</th>
<th>EU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80-85</td>
<td>86-90</td>
</tr>
<tr>
<td><strong>shared</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aver.</td>
<td>-0.12</td>
<td>-0.10</td>
</tr>
<tr>
<td>SD</td>
<td>0.85</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Imp</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aver.</td>
<td>-0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>SD</td>
<td>0.66</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Exp</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aver.</td>
<td>0.42</td>
<td>-0.01</td>
</tr>
<tr>
<td>SD</td>
<td>0.63</td>
<td>0.59</td>
</tr>
</tbody>
</table>
Observations

- Overall effect of standards in agriculture seems to decrease. However, this is due to **offsetting directions of effects** for different country-groups.

- **EU standards** seem to grow **more restrictive** over time.

- Important role of **exporter standards**
Interpretation

• As countries integrate, additional benefits of harmonization decrease: the loss of variety effect outweighs the no adaptation cost effect

• As countries integrate, insider-standards (country-specific) gain power while outsider-standards lose power
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Summary:

- Standards provide information and harmonization services, can impose adaptation costs across countries and reduce variety. Essential to recognize *trade-offs* between the different forces.

- Some evidence that harmonization (in agriculture) leads to *insider-outsider* distinction.

- Some evidence that *barrier effect of EU standards* increased for outsiders.
Policy Implications

• Country-specific importer standards not always a barrier to trade, harmonization not always beneficial

• Don’t cure symptoms: Issue is market access, not standards – information and variety key

• Food is a sensitive issue. Let the interested parties choose what to harmonize … and don’t forget the consumers 😊