An Empirical Investigation of the Relationship between the Quality of Food and the Direction of Trade

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This study questions whether a systematic relationship between the quality of food and the direction of trade exists. In order to answer this question, I rely on the theoretical framework developed by Hallak (2010), who has shown that countries differ in their valuation of quality. I argue that the quality of food produced and consumed by a country varies systematically with the income level. This interaction of demand for and supply of quality results in a gravity-type specification, which is the empirical framework utilized in this study. The relationship is investigated for 737 agricultural and food products at the 6-digit HS code level. My sample comprises data on bilateral trade flows between 152 countries for 1995-2012. The gravity equation is estimated year by year and sector by sector. I am able to show that similar demand structures are an important determinant of bilateral export trade. My findings indicate that the similarity effect is stronger for processed products and weakest for bulk products. From those results I come to the conclusion that similar aggregate preferences are an important determinant of export trade in final consumption goods.

### Background & Motivation

- **Global food trade has become a diverse and complex business in which most countries participate**
- **Major driving forces of trade growth and diversification are:**
  1. Technological progress (e.g., safer food, lower probability of perishable and higher attractiveness to customers),
  2. Lower transport cost and risk (e.g., access to remote markets and wider product variety),
  3. Changing taste and eating habits (e.g., income growth puts emphasis on the permanent availability of high quality food and a greater supply variability)
- **Trade expansion has helped to provide greater quantity, wider variety and better quality of food to an increasing number of people → Limited and contradicting literature on the relation between food quality and bilateral trade!**
- **Hypothesis: "A systematic relationship between quality of food and the direction of trade exists."**

### Identification Strategy

- **Sectoral gravity equation based on theoretical framework in Hallak (2010):**
  \[
  X_{ij,t} = \exp(\varepsilon_{ij} - \theta \log x_{ij,t} + m_{ij}) + \varepsilon_{ij,t}
  \]
  where \(X_{ij,t}\) is bilateral export flows of product \(i\) from country \(i\) to country \(j\) in year \(t\)
  - **Accounting for multilateral trade resistances with sector-specific fixed effects for exporters \(\varepsilon_{ij}\) and importers \(m_{ij}\)**
  - **Trade cost function is denoted by \(\varepsilon_{ij}\) (symmetrical and of the iceberg form)**

### Empirical Model

**Results**

- **Equation 1 was estimated by Poisson PML separately for each of the 737 agricultural and food sectors and for each year of the observation period**
- **83.5% of the estimates for the similarity index have a negative sign and 57.1% of them are significant and have a negative sign**
- **Median effect is -0.090, which is in line with the literature (Hallak, 2010)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Positive</th>
<th>Negative</th>
<th>Median effect</th>
<th>Significant</th>
<th>Not significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarity index</td>
<td>390</td>
<td>0</td>
<td>-0.090 (0.026)</td>
<td>-0.189 (0.046)</td>
<td>-0.302 (0.052)</td>
</tr>
<tr>
<td>Weighted distance</td>
<td>170</td>
<td>0</td>
<td>-0.509 (0.283)</td>
<td>-0.298 (0.244)</td>
<td>-0.602 (0.312)</td>
</tr>
<tr>
<td>Shared border</td>
<td>690</td>
<td>0</td>
<td>1.441 (0.413)</td>
<td>1.635 (0.374)</td>
<td>0.724 (0.526)</td>
</tr>
<tr>
<td>Economic integration</td>
<td>668</td>
<td>0</td>
<td>1.051 (0.272)</td>
<td>1.230 (0.215)</td>
<td>0.425 (0.315)</td>
</tr>
<tr>
<td>WTO membership</td>
<td>705</td>
<td>21</td>
<td>1.796 (0.332)</td>
<td>1.954 (0.334)</td>
<td>0.710 (0.325)</td>
</tr>
<tr>
<td>Common language</td>
<td>467</td>
<td>259</td>
<td>0.244 (0.261)</td>
<td>0.844 (0.265)</td>
<td>0.074 (0.261)</td>
</tr>
<tr>
<td>Common legacy</td>
<td>47</td>
<td>679</td>
<td>-1.946 (0.736)</td>
<td>-2.591 (0.708)</td>
<td>-0.989 (0.786)</td>
</tr>
<tr>
<td>Common colonizer</td>
<td>604</td>
<td>122</td>
<td>0.642 (0.403)</td>
<td>1.627 (0.374)</td>
<td>0.453 (0.527)</td>
</tr>
<tr>
<td>Exporters</td>
<td>28</td>
<td>698</td>
<td>-2.951 (0.745)</td>
<td>-2.322 (0.539)</td>
<td>-0.709 (0.400)</td>
</tr>
</tbody>
</table>

Notes: The summary statistics are based on the mean parameter estimates for 1995-2012. Columns 1 and 2 break down the parameter estimates by sign. Column 3 reports the median size of the parameter estimate and column 4 shows its significance and column 5 provides a breakdown by significance. The corresponding median standard-error is reported in parentheses. Standard-errors are robust to heteroskedasticity and clustered by country pair.

- **Compare the parameter estimates of the similarity index for different types of agricultural and food products (defined according to Regmi et al., 2005)**
- **Highest share of significant estimates with a negative sign is found for processed products, which usually have a higher per unit value and are of better quality**
- **Similarity effect is strongest for processed products, which are followed by products that are semi-processed or from aqua-farming**

### Conclusion

- **Sectoral gravity equation utilized to test for a systematic relationship between the quality of food and the direction of trade**
- **Results show that aggregate preferences are an important determinant of bilateral export trade in agricultural and food products**
- **Effect is strongest for processed products and weakest for bulk products**

### References