# Online Appendix to "Economic Integration and Diffusion of Regulatory Standards: Evidence from Trade Networks"

**Sergio H. Rocha**
*Monash University*

**Prakrati Thakur**
*Rensselaer Polytechnic Institute*

## OA.1 Alternative Measures of Network Centrality

We assess the soundness of our baseline results by estimating Equation (1) after replacing $AE$ and $AI$ with other measures of network centrality (Freeman, 1978; Agneessens, Opsahl and Skvoretz, 2010). In addition, we consider different kinds of networks when constructing these alternative measures to determine that it's the connectedness in trade to countries *that have adopted a regulation* that drives diffusion rather than overall trade relations. Therefore, this exercise serves both as a robustness check to alternative metrics and a placebo test by showing that what matters for domestic adoption is not trade relations per se, but integration with countries that have a regulation in place.

To construct our measure of network centrality in exports, we consider directed yearly trade networks where a connection from country $i$ to country $j$ exists when $i$ exports to $j$. Analogously, we consider country $i$ to be connected to country $j$ when $i$ imports from $j$ to build our import-based metrics. We use two measures of centrality that are common in the networks literature: degree and harmonic. Degree centrality simply counts the number of links originating at each node (country). Harmonic centrality is a measure of closeness that accommodates isolated nodes and groups of nodes (Latora and Marchiori, 2001; Saxena and Iyengar, 2020).[1] We provide details on the construction of these centrality

[1] Closeness scores measure how close each node is with all others in the network. We find cases of isolated nodes and groups of nodes in our data due to countries that do not export or import certain

measures in Section OA.1.1.

We incorporate these measures in two ways. First, we focus solely on overall trade relationships, building yearly networks of bilateral trade for each commodity. In this scenario, our measures will be at the product-country-year level and capture how well-connected, i.e., how *central*, a country is as an exporter or importer of each product. Second, for each regulatory standard, we construct yearly networks of trade *only with countries with the regulation in place*. Here, for country $i$ to be linked to country $j$ in exports (imports), $i$ must export to (import from) $j$ and $j$ must have the regulation of interest in place. Thus, the centrality score will be at the product-regulation-country-year level and gauge countries' centrality in trade of each product that comply with each regulation. Since our proposed channel of adoption is diffusion stemming from standard-imposing countries, we expect to find sharper results in the latter networks.

Networks can also be unweighted or weighted, with the latter assigning weights that reflect the strength of the connection to each link. In our study, the weight of a link from $i$ to $j$ is $j$'s share in $i$'s total exports or imports. We apply weighting only to the harmonic measure because a weighted degree measure sums the weights of a node's connections. Therefore, in our trade-based networks, this measure would simply add to one for each product-country-year with positive exports. In our adoption-based networks, weighted degree measures would coincide with our original variables $AE$ and $AI$.

The results of this exercise with trade-based centrality measures are in Table OA.1. Here, we cannot use product-country-year fixed effects as these would absorb the independent variables.[2] Although we find positive and significant coefficients in columns (1) and (4), these results no longer hold on controlling for confounders with additional fixed effects. In stark contrast, all the estimates are consistently positive and significant for both export- and import-based measures in Table OA.2, where we use adoption-based networks. In the most saturated models, we estimate that a one s.d. increase in *Export*

commodities.

[2]Note that the sample is still at the product-regulation-country-year level because each trade-based centrality measure is matched to multiple NTMs.

*Degree*, *Export Harmonic*, and *Export Weighted Harmonic* is associated with 6.17, 6.56, and 2.81 b.p. increase in probability of domestic adoption, which corresponds to 28.49%, 30.30%, and 12.98% of average adoption, respectively. For the import-based centrality measures, these figures are 5.08, 5.65, and 1.21 b.p., corresponding to 23.44%, 26.07%, and 5.57% of average adoption, respectively. Thus, we find robust evidence for diffusion only in adoption networks regardless of how we measure economic integration.

Table OA.1: Alternative Measures of Network Centrality - Trade Networks

This table reports the estimation of Equation (1) via OLS with alternative measures of network centrality based on trade. The sample consists of product-regulation-country-year observations where *Adopted (%)* is an indicator of the year a country domestically adopts a regulation on a product, in percentages. We exclude product-regulation-country observations after the year of adoption. The main independent variables are centrality measures where the export (import) measures, consider country $A$ linked to country $B$ when $A$ exports (imports) a product to (from) $B$. See Section OA.1 for details on variable construction. Significance levels are indicated by *, **, and *** at the 5%, 1%, and 0.1% level, respectively. Standard errors are two-way clustered by product-country and product-year.

| | Adopted (%) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| *Export Degree* | 2.39*** | −0.37*** | −0.38*** | | | | | | |
| | (0.04) | (0.04) | (0.04) | | | | | | |
| *Import Degree* | 1.22*** | −0.13** | −0.12** | | | | | | |
| | (0.05) | (0.04) | (0.04) | | | | | | |
| *Export Harmonic* | | | | 0.12*** | −0.01* | −0.04*** | | | |
| | | | | (0.01) | (0.01) | (0.01) | | | |
| *Import Harmonic* | | | | 0.17*** | −0.05*** | −0.05*** | | | |
| | | | | (0.01) | (0.01) | (0.01) | | | |
| *Export Weighted Harmonic* | | | | | | | −0.93*** | −0.12 | −0.50*** |
| | | | | | | | (0.07) | (0.06) | (0.06) |
| *Import Weighted Harmonic* | | | | | | | −2.15*** | −0.19* | −0.19*** |
| | | | | | | | (0.09) | (0.08) | (0.08) |
| *Affected Agreements* | | | 0.72*** | | | 0.72*** | | | 0.72*** |
| | | | (0.02) | | | (0.02) | | | (0.02) |
| *Competitor Pressure* | | | 0.50*** | | | 0.51*** | | | 0.52*** |
| | | | (0.02) | | | (0.02) | | | (0.02) |
| $\mu_{pri}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{prt}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{rit}$ | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| $\mu_{pit}$ | | | | | | | | | |
| $N$ | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 |
| $Adj R^2$ | 0.07 | 0.26 | 0.26 | 0.07 | 0.26 | 0.26 | 0.07 | 0.26 | 0.26 |

Table OA.2: Alternative Measures of Network Centrality - Adoption Networks

This table reports the estimation of Equation (1) via OLS with alternative measures of network centrality based on trade and adoption. The sample consists of product-regulation-country-year observations where *Adopted (%)* is an indicator of the year a country domestically adopts a regulation on a product, in percentages. We exclude product-regulation-country observations after the year of adoption. The main independent variables are centrality measures where the export (import) measures, consider country $A$ linked to country $B$ when $A$ exports (imports) a product to (from) $B$ and $B$ has the regulation in place. See Section OA.1 for details on variable construction. Significance levels are indicated by *, **, and *** at the 5%, 1%, and 0.1% level, respectively. Standard errors are two-way clustered by product-country and product-year.

| | Adopted (%) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| *Export Degree* | 20.32*** | 7.66*** | 7.19*** | | | | | | |
| | (0.33) | (0.26) | (0.26) | | | | | | |
| *Import Degree* | 16.02*** | 6.83*** | 6.14*** | | | | | | |
| | (0.31) | (0.26) | (0.25) | | | | | | |
| *Export Harmonic* | | | | 13.52*** | 5.29*** | 4.91*** | | | |
| | | | | (0.18) | (0.14) | (0.14) | | | |
| *Import Harmonic* | | | | 13.01*** | 4.61*** | 4.17*** | | | |
| | | | | (0.21) | (0.18) | (0.17) | | | |
| *Export Weighted Harmonic* | | | | | | | 41.67*** | 19.31*** | 17.53*** |
| | | | | | | | (0.96) | (0.74) | (0.72) |
| *Import Weighted Harmonic* | | | | | | | 22.18*** | 6.56*** | 5.54*** |
| | | | | | | | (0.62) | (0.49) | (0.48) |
| *Affected Agreements* | | | 0.54*** | | | 0.55*** | | | 0.56*** |
| | | | (0.02) | | | (0.02) | | | (0.02) |
| *Competitor Pressure* | | | 0.32*** | | | 0.29*** | | | 0.37*** |
| | | | (0.02) | | | (0.02) | | | (0.02) |
| $\mu_{pri}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{prt}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{rit}$ | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| $\mu_{pit}$ | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| $N$ | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 | 126,534,427 |
| $AdjR^2$ | 0.07 | 0.36 | 0.36 | 0.07 | 0.36 | 0.36 | 0.07 | 0.36 | 0.36 |

### OA.1.1 Construction of Centrality Measures

In this section, we provide more details on the construction of the two centrality measures. Degree centrality simply counts the number of links originating at each node. Hence, in the trade-based networks, *Export Degree* and *Import Degree* are number of export and import partners for each country-commodity, respectively. In the adoption-based networks, for each commodity-regulation pair, a country's degree centrality measures the number of export and import partners with the regulation in place.

Harmonic centrality is a measure of closeness that accommodates isolated nodes and groups of nodes. According to this metric, a node will be more central the shorter the distances from it to all other nodes in a network. The measure $Harmonic$ for node $i$ is:

$$Harmonic_i = \sum_{j \neq i} \frac{1}{d(i,j)}, \tag{1}$$

where $d(i,j)$ is the number of nodes in the shortest path between $i$ and $j$. The shortest path between any two nodes $i$ and $j$ in the network is the path from $i$ to $j$ crossing the fewest number of nodes. If there's no path between $i$ and $j$, then $\frac{1}{d(i,j)} = 0$. To construct a weighted harmonic centrality measure, the shortest path between $i$ and $j$ minimizes the sum of weights rather than the number of links along all paths leading from $i$ to $j$, where $d(i,j)$ becomes the sum of the weights along the shortest path. Therefore, the weights are interpreted as distances between two nodes. Since a country's share of exports or imports to another measure the strength of the link, we use their inverse values as weights.

For ease of interpretation, our centrality measures are normalized by the number of possible links that a node might have. In our framework, this is the number of countries in the network minus one. We divide the raw degree and harmonic centrality scores by this number so that both measures take values between zero and one. Table OA.3 reports summary statistics on the centrality measures. Trade-based centrality measures show that, on average, a country exports (imports) each product to (from) 6.55% of the other countries in the sample and has a mean inverse path length of 22.64% to (from)

Table OA.3: Summary Statistics

This table reports summary statistics on the alternative network centrality measures that we use in Appendix A. In the product-country-year networks, an export (import) link between countries $A$ and $B$ exists when country $A$ exports (imports) a product to (from) country $B$. In the product-regulation-country-year networks, an export (import) link between countries $A$ and $B$ exists when $A$ exports (imports) the product to (from) $B$ and $B$ has the standard on that product in place. For the weighted measures, the weight of the export (import) link is the inverse of the share of exports (imports) of $A$ to (from) $B$. See Section OA.1 for details on variable construction.

| **Other Measures of Centrality (%)** | Mean | Median | Std. Deviation | Observations |
|---|---|---|---|---|
| **HS6-Country-Year Networks** | | | | |
| *Export Degree* | 6.55 | 1.10 | 14.54 | 9,386,515 |
| *Import Degree* | 6.55 | 4.40 | 7.86 | 9,386,515 |
| *Export Harmonic* | 22.64 | 1.65 | 25.62 | 9,343,965 |
| *Import Harmonic* | 22.64 | 21.79 | 16.06 | 9,343,965 |
| *Export Weighted Harmonic* | 1.62 | 1.10 | 1.66 | 9,386,515 |
| *Import Weighted Harmonic* | 1.86 | 2.13 | 0.94 | 9,386,515 |
| **HS6-NTM-Country-Year Networks** | | | | |
| *Export Degree* | 0.19 | 0.00 | 0.86 | 126,534,427 |
| *Import Degree* | 0.28 | 0.00 | 0.83 | 126,534,427 |
| *Export Harmonic* | 0.30 | 0.00 | 1.34 | 126,534,427 |
| *Import Harmonic* | 0.42 | 0.00 | 1.35 | 126,534,427 |
| *Export Weighted Harmonic* | 0.03 | 0.00 | 0.16 | 126,534,427 |
| *Import Weighted Harmonic* | 0.06 | 0.00 | 0.22 | 126,534,427 |

other countries in the unweighted measure and 1.62% (1.86%) in the weighted version. Unsurprisingly, these figures are much smaller in sparser adoption-based networks, at 0.19% (0.28%), 0.30% (0.42%), and 0.03% (0.06%), respectively.

## OA.2 Extra-EU Diffusion

When treatment assumes shift-share like structure, the inclusion of major players can substantially alter results via the weights in $AE$ and $AI$. In our framework, the EU as a whole is a key importer and exporter of multiple commodities, accounting for a share of over 17% of within-sample total imports between 1995 and 2020. Thus, the adoption of a regulation by the EU has a large impact on the exposure of other countries to treatment. To ensure that our findings are not heavily dependent on regulatory diffusion from the EU to the rest of the world, we re-estimate our IV regressions excluding the EU from

our sample altogether. Table OA.4 shows that the point estimates obtained on excluding EU are larger than those in Table 4 but follow similar patterns across specifications.[3] We estimate that a one s.d. increase in $AE$, roughly 9.67 p.p, leads to a 1.35-3.15 b.p. increase in domestic adoption probability, which corresponds to 6.26-14.57% of average adoption. Similarly, a one s.d. increase in $AI$, roughly 15.20 p.p., leads to 0.52-2.95 b.p. higher adoption probability, corresponding to 2.38-13.64% of the mean. As the exclusion of the EU leads to qualitatively similar and quantitatively stronger estimates, we conclude that our results are robust to the exclusion of a major trade partner and provide further evidence of substantial extra-EU regulatory diffusion, especially via export networks.

[3]The gap in the number of observations between Table 4 and Table OA.4 is explained by aggregation of predicted trade flows at the EU level and treatment of a missing predicted trade flow for any EU country as a missing trade flow for the EU as a whole. When we perform the IV estimation including EU, the export or import shares would contain missing values both when any EU country has missing exports and imports from another country. On excluding EU, however, these two forms of missingness disappear.

Table OA.4: Estimation of Regulatory Diffusion Without EU - Air and Sea Distance IV

This table reports the estimation of Equation (1) via IV regression, with the European Union excluded from the sample. The sample consists of product-regulation-country-year observations where *Adopted (%)* is an indicator of the year a country domestically adopts a regulation on a product, in percentages. We exclude product-regulation-country observations after the year of adoption. The main independent variables, *Affected Exports* and *Affected Imports*, are the export and import shares, respectively, of a product that comply with a standard while *Affected Exports IV* and *Affected Imports IV* are their instruments, which use trade flows predicted by time-varying air and sea distances. See Section 3 for details on variable construction. Significance levels are indicated by $^{*}$, $^{**}$, and $^{***}$ at the 5%, 1%, and 0.1% level, respectively. Standard errors are two-way clustered by product-country and product-year.

**Panel A. First Stage**

| | *Affected Exports (%)* | | | *Affected Imports (%)* | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| *Affected Exports IV* | 92.57*** | 92.37*** | 92.39*** | 0.92*** | 0.77*** | 0.73*** |
| | (0.10) | (0.09) | (0.09) | (0.06) | (0.06) | (0.06) |
| *Affected Imports IV* | 0.10*** | 0.08*** | 0.09*** | 88.04*** | 87.59*** | 87.58*** |
| | (0.02) | (0.02) | (0.02) | (0.09) | (0.08) | (0.08) |
| *Affected Agreements* | | | 0.00*** | | | 0.14*** |
| | | | (0.00) | | | (0.04) |
| *Competitor Pressure* | | | −0.80*** | | | 0.99*** |
| | | | (0.07) | | | (0.09) |
| $\mu_{pri}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{prt}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{rit}$ | | ✓ | ✓ | | ✓ | ✓ |
| $\mu_{pit}$ | | ✓ | ✓ | | ✓ | ✓ |
| *F-statistic* | 444,484 | 558,586 | 558,586 | 43,596 | 95,338 | 95,338 |
| *N* | 63,148,562 | 63,148,562 | 63,148,562 | 63,148,562 | 63,148,562 | 63,148,562 |
| $AdjR^2$ | 0.84 | 0.86 | 0.86 | 0.81 | 0.84 | 0.84 |

**Panel B. Second Stage**

| | *Adopted (%)* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| *Affected Exports* | 0.33*** | 0.15*** | 0.14*** |
| | (0.02) | (0.02) | (0.02) |
| *Affected Imports* | 0.19*** | 0.04*** | 0.03*** |
| | (0.01) | (0.01) | (0.01) |
| *Affected Agreements* | | | 0.07*** |
| | | | (0.01) |
| *Competitor Pressure* | | | 0.26*** |
| | | | (0.03) |
| $\mu_{pri}$ | ✓ | ✓ | ✓ |
| $\mu_{prt}$ | ✓ | ✓ | ✓ |
| $\mu_{rit}$ | | ✓ | ✓ |
| $\mu_{pit}$ | | ✓ | ✓ |
| *N* | 63,148,562 | 63,148,562 | 63,148,562 |
| $AdjR^2$ | 0.12 | 0.40 | 0.40 |

# OA.3 Additional Figures and Tables

Figure OA.1: Evolution of Adoption

Each panel in this figure represents adoption of a regulation, as specified by an NTM code, by countries over the years. The vertical axes represent the share of countries with the regulation in place by the corresponding year on horizontal axes. The blue lines depict the time series observed in data and the dotted line represents the 5% threshold.

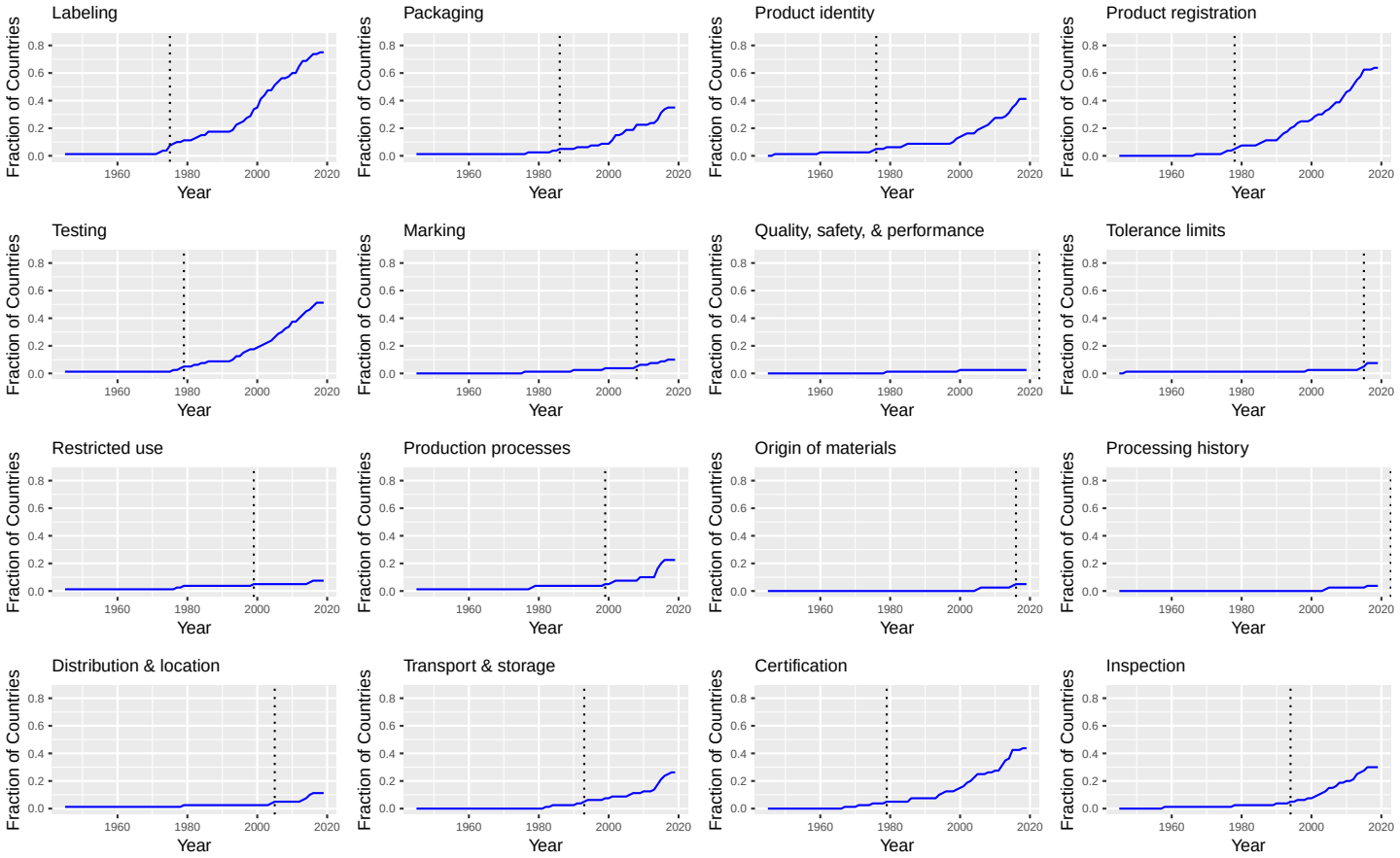

Figure OA.2: Evolution of Coverage Ratio

Each panel in this figure shows the evolution of Coverage Ratio of each regulation, as specified by NTM code, over the years. Coverage ratio is defined as the fraction of within-sample trade that is affected by a regulation. The blue lines depict the time series observed in data and the dotted line represents the 5% threshold.

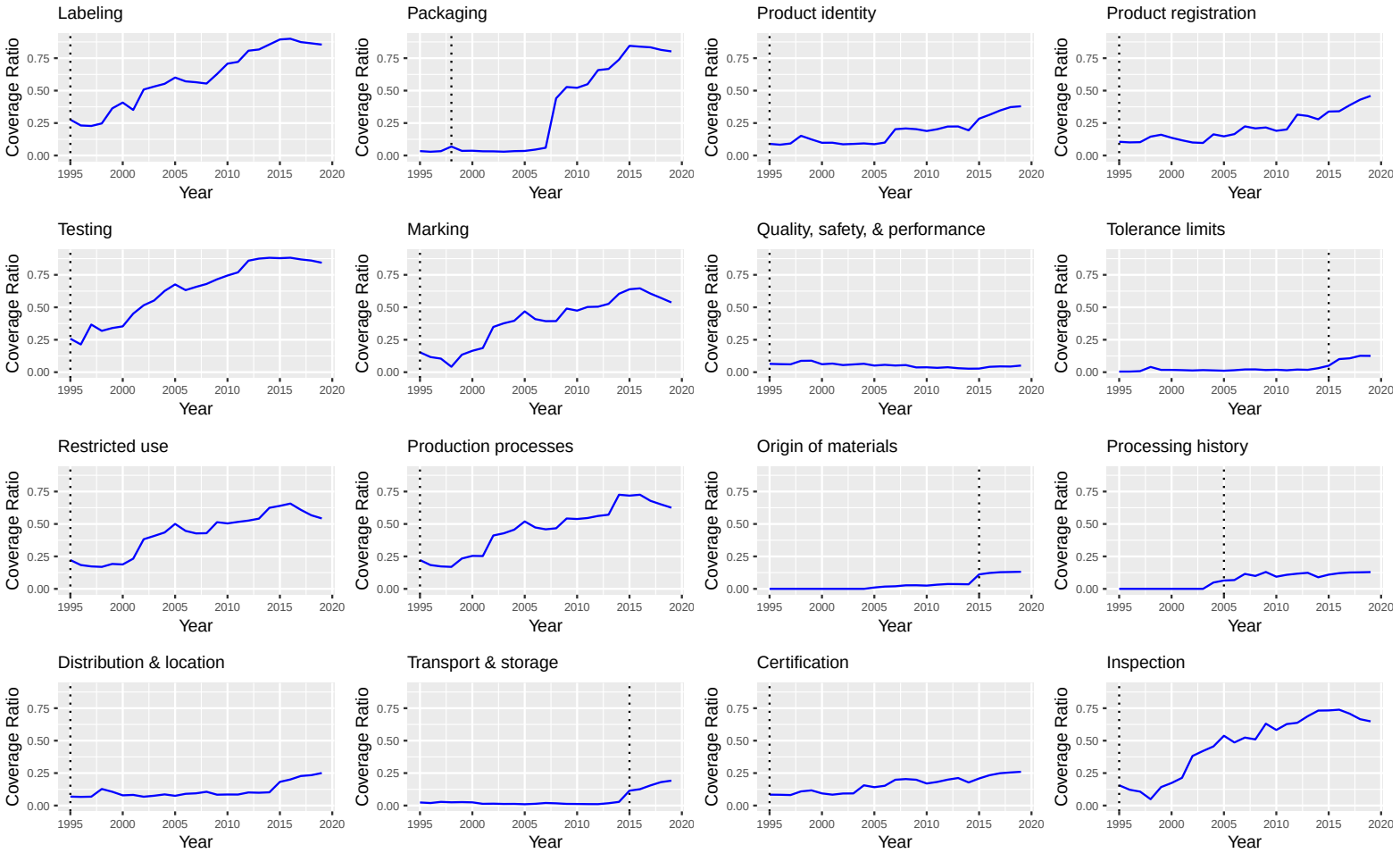

Figure OA.3: Share of World Trade among Countries within Sample

This figure depicts the share of total world trade among the countries in our sample. For each year, we compute the ratio of total trade flows among the countries within our sample to total world trade in the HS6 commodities for which we have TBT information. The figure plots the evolution of this ratio over the sample period.

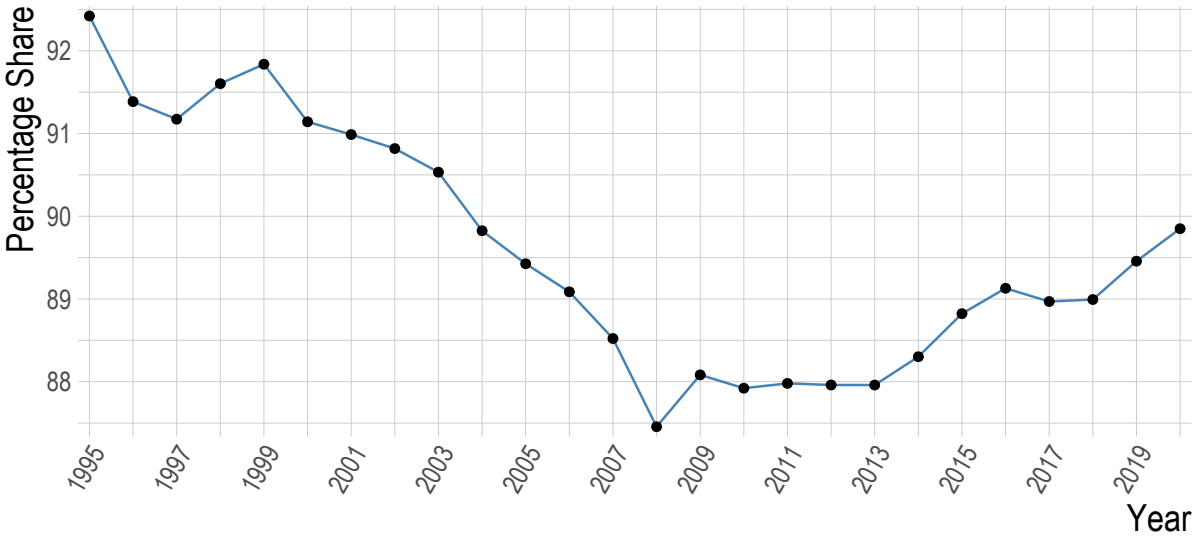

Table OA.5: Technical Barriers to Trade

This table provides an example of a regulation under each NTM code in our data, obtained from United Nations Conference on Trade and Development (2019).

**B21: Tolerance limits**

- ***Example:*** *The salt level in cement or sulphur level in gasoline must be below the specified amount.*

**B22: Restricted use**

- ***Example:*** *This measure refers to the restricted use of solvents in paints and the maximum level of lead allowed in consumer paint.*

**B31: Labelling**

- ***Example:*** *Refrigerators must carry a label indicating size, weight and level of electricity consumption.*

**B32: Marking**

- ***Example:*** *Handling or storage conditions according to the type of product must be specified; typically, indications such as "Fragile" or "This side up" must be marked on the transport container.*

**B33: Packaging**

- ***Example:*** *Palletized containers or special packages should be used for the protection of sensitive or fragile products.*

**B41: Production processes**

- ***Example:*** *Animal slaughtering requirements according to Islamic law must be followed.*

**B42: Transport and Storage**

- ***Example:*** *Medicines should be stored below a certain temperature.*

**B6: Product identity**

- ***Example****: For a product to be identified as chocolate, it must contain a minimum of 30 per cent cocoa.*

**B7: Quality, Safety, and Performance**

- ***Examples:*** *Doors must resist a certain minimum high temperature.*

**B81: Product registration**

- ***Example:*** *Drugs and medicines must be registered before they can be imported. They should prove to be safe and effective for their intended purpose in order to be registered.*

**B82: Testing**

- ***Example:*** *Testing of a sample of motor vehicle imports is required to show compliance with safety standards.*

**B83: Certification**

- ***Example:*** *A certificate of conformity is required for electric products.*

**B84: Inspection**

- ***Example:*** *Textile and clothing imports must be inspected for size and materials used before entry is allowed.*

**B51: Origin of materials**

- ***Example:*** *Manufactures of automobiles must keep the record of the origin of the original set of tyres for each vehicle.*

**B852: Processing history**

- ***Example:*** *For wool apparel products, disclosure of information on the origin of the sheep, location of the textile factory, as well as the identity of the final apparel producer, may be required.*

**B853: Distribution and location after delivery**

- ***Example:*** *Before placing imported cosmetic products on the European Union market, the person responsible must indicate to the competent authority of the member State where the products were initially imported, the address of the manufacturer or the address of the importer.*

Table OA.6: Correlation Matrix

This table reports pairwise correlations between the variables used in our main analysis. The sample consists of product-regulation-country-year observations where products and regulations are HS6 levels and NTMs, respectively. All variables are in percentages. *Adopted* is an indicator for the year a country domestically adopts a regulation on a product. We exclude from the sample product-regulation-country observations after the year of adoption. *Affected Exports* and *Affected Imports* are the export and import shares, respectively, of a product that must comply with a standard while *Affected Exports IV* and *Affected Imports IV* are their instruments, which use trade flows predicted by time-varying air and sea distances. *Affected Agreements* is the share of a country's trade agreement partners and *Competitor Pressure* is the share of the top 10 export competitors that have the regulation in place. See Section 3 for details on variable construction.

| | *Adopted* | *Affected Exports* | *Affected Exports IV* | *Affected Imports* | *Affected Imports IV* | *Affected Agreements* | *Competitor Pressure* |
|---|---|---|---|---|---|---|---|
| *Adopted* | 1.00 | 0.02 | 0.01 | 0.02 | 0.01 | 0.03 | 0.03 |
| *Affected Exports* | - | 1.00 | 0.90 | 0.32 | 0.21 | 0.21 | 0.23 |
| *Affected Exports IV* | - | - | 1.00 | 0.22 | 0.20 | 0.15 | 0.21 |
| *Affected Imports* | - | - | - | 1.00 | 0.87 | 0.26 | 0.26 |
| *Affected Imports IV* | - | - | - | - | 1.00 | 0.20 | 0.18 |
| *Affected Agreements* | - | - | - | - | - | 1.00 | 0.24 |
| *Competitor Pressure* | - | - | - | - | - | - | 1.00 |

Table OA.7: Gravity Regression Results - Balanced Panel

This table reports the estimation of Equations (2) and (4). The sample consists of a balanced panel where only those product-exporter-importer combinations are included for which trade is observed across all sample years. $ln(trade)$ is the natural log of trade flows. The independent variables are the interactions of time-invariant logged air and sea distances with separate time indicators of five years each. Significance levels are indicated by *, **, and *** at the 5%, 1%, and 0.1% level, respectively. Standard errors are clustered by exporter-importer.

| | ln(trade) | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| ln(airdist) | | | -0.68*** | | -0.61*** |
| $\times \mathbb{1}(1995 \leq year \leq 2000)$ | | | (0.07) | | (0.07) |
| ln(airdist) | 0.04*** | 0.04*** | -0.71*** | -0.01 | -0.63*** |
| $\times \mathbb{1}(2001 \leq year \leq 2005)$ | (0.00) | (0.00) | (0.06) | (0.01) | (0.07) |
| ln(airdist) | 0.10*** | 0.10*** | -0.67*** | -0.02 | -0.66*** |
| $\times \mathbb{1}(2006 \leq year \leq 2010)$ | (0.01) | (0.01) | (0.06) | (0.01) | (0.07) |
| ln(airdist) | 0.11*** | 0.11*** | -0.58*** | -0.03 | -0.69*** |
| $\times \mathbb{1}(2011 \leq year \leq 2015)$ | (0.01) | (0.01) | (0.07) | (0.02) | (0.07) |
| ln(airdist) | 0.10*** | 0.10*** | -0.64*** | -0.02 | -0.69*** |
| $\times \mathbb{1}(2016 \leq year \leq 2020)$ | (0.01) | (0.01) | (0.06) | (0.02) | (0.07) |
| ln(seadist) | -0.82*** | -0.82*** | -0.36*** | -0.87*** | -0.38*** |
| $\times \mathbb{1}(1995 \leq year \leq 2000)$ | (0.13) | (0.13) | (0.06) | (0.13) | (0.06) |
| ln(seadist) | -0.85*** | -0.85*** | -0.34*** | -0.87*** | -0.39*** |
| $\times \mathbb{1}(2001 \leq year \leq 2005)$ | (0.13) | (0.13) | (0.05) | (0.13) | (0.06) |
| ln(seadist) | -0.91*** | -0.91*** | -0.38*** | -0.87*** | -0.38*** |
| $\times \mathbb{1}(2006 \leq year \leq 2010)$ | (0.13) | (0.13) | (0.05) | (0.13) | (0.06) |
| ln(seadist) | -0.89*** | -0.89*** | -0.43*** | -0.87*** | -0.37*** |
| $\times \mathbb{1}(2011 \leq year \leq 2015)$ | (0.13) | (0.13) | (0.06) | (0.13) | (0.06) |
| ln(seadist) | -0.90*** | -0.90*** | -0.40*** | -0.88*** | -0.38*** |
| $\times \mathbb{1}(2016 \leq year \leq 2020)$ | (0.13) | (0.13) | (0.06) | (0.13) | (0.06) |
| $X_{ij}$ | | | ✓ | | ✓ |
| $X_{it}$ and $X_{jt}$ | | | ✓ | | |
| $\mu_{pj}$ | ✓ | | ✓ | ✓ | |
| $\mu_{pi}$ | | ✓ | ✓ | ✓ | |
| $\mu_t$ | | | ✓ | | |
| $\mu_{it}$ and $\mu_{jt}$ | | | | ✓ | |
| $\mu_{pit}$ and $\mu_{pjt}$ | | | | | ✓ |
| $\mu_{ij}$ | ✓ | ✓ | | ✓ | |
| $N$ | 34,394,334 | 34,394,334 | 34,394,334 | 34,394,334 | 34,394,334 |
| $AdjR^2$ | 0.50 | 0.58 | 0.63 | 0.68 | 0.67 |

Table OA.8: Heterogeneity in Regulation Adoption: Alternative Classifications

This table reports the estimation of Equation (1) via IV regression after interacting *Affected Exports* with cross-sectional variables. The sample consists of product-regulation-country-year observations where *Adopted (%)* is an indicator of the year a country domestically adopts a regulation on a product, in percentages. We exclude product-regulation-country observations after the year of adoption. The main independent variables, *Affected Exports* and *Affected Imports*, are the export and import shares, respectively, of a product that comply with a standard while *Affected Exports IV* and *Affected Imports IV* are their instruments, which use trade flows predicted by time-varying air and sea distances. *Product Regulation* is an indicator of the NTM belonging to product standards, after dropping NTMs B83, B84, B85, and B89. *Final Product* is an indicator of the HS6 being a final product while *Capital Product* is an indicator of the HS6 being a capital good. See Sections 3 and 8 for details on variable construction. Significance levels are indicated by $^{*}$, $^{**}$, and $^{***}$ at the 5%, 1%, and 0.1% level, respectively. Standard errors are two-way clustered by product-country and product-year.

| | Adopted (%) | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Affected Exports* | 0.14*** | 0.05* | 0.05* | 0.17*** | 0.05* | 0.04* |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) |
| *Affected Exports* × *Product Regulation* | 0.13*** | 0.09*** | 0.08*** | | | |
| | (0.03) | (0.02) | (0.02) | | | |
| *Affected Exports* × *Final Product* | | | | 0.16*** | 0.18*** | 0.18*** |
| | | | | (0.04) | (0.03) | (0.03) |
| *Affected Exports* × *Capital Product* | | | | -0.05 | 0.01 | 0.01 |
| | | | | (0.03) | (0.03) | (0.03) |
| *Affected Imports* | 0.11*** | 0.02 | 0.01 | 0.10*** | 0.02* | 0.02 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| *Affected Agreements* | | | 0.09*** | | | 0.07*** |
| | | | (0.02) | | | (0.02) |
| *Competitor Pressure* | | | 0.23*** | | | 0.15*** |
| | | | (0.04) | | | (0.03) |
| $\mu_{pri}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{prt}$ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| $\mu_{rit}$ | | ✓ | ✓ | | ✓ | ✓ |
| $\mu_{pit}$ | | ✓ | ✓ | | ✓ | ✓ |
| $N$ | 34,966,584 | 34,966,584 | 34,966,584 | 51,188,881 | 51,188,881 | 51,188,881 |
| $AdjR^2$ | 0.13 | 0.41 | 0.41 | 0.12 | 0.41 | 0.41 |

Table OA.9: Estimation of Regulatory Diffusion - OLS

This table reports the estimation of Equation (1) via OLS with full sample. The sample consists of product-regulation-country-year observations where *Adopted (%)* is an indicator of the year a country domestically adopts a regulation on a product, in percentages. We exclude product-regulation-country observations after the year of adoption. The main independent variables, *Affected Exports* and *Affected Imports*, are the export and import shares, respectively, of a product that comply with a standard. See Section 3 for details on variable construction. Significance levels are indicated by *, **, and *** at the 5%, 1%, and 0.1% level, respectively. Standard errors are two-way clustered by product-country and product-year.

| | *Adopted (%)* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| *Affected Exports* | 0.44*** | 0.19*** | 0.17*** |
| | (0.01) | (0.01) | (0.01) |
| *Affected Imports* | 0.27*** | 0.07*** | 0.06*** |
| | (0.01) | (0.01) | (0.01) |
| *Affected Agreements* | | | 0.57*** |
| | | | (0.02) |
| *Competitor Pressure* | | | 0.38*** |
| | | | (0.02) |
| $\mu_{pri}$ | ✓ | ✓ | ✓ |
| $\mu_{prt}$ | ✓ | ✓ | ✓ |
| $\mu_{rit}$ | | ✓ | ✓ |
| $\mu_{pit}$ | | ✓ | ✓ |
| $N$ | 126,534,427 | 126,534,427 | 126,534,427 |
| $Adj R^2$ | 0.07 | 0.36 | 0.36 |

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