Non-Tariff Measures as an Environmental Governance Mechanism in International Trade

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PROBLEM

STATEMENT

International trade *versus* environment

The synergy between international trade and environmental preservation is a complex and relevant topic for global development oriented toward sustainability

Nations can **preserve their natural resources** and ecosystems services increasing the import of products that cause environmental damage in exporting countries
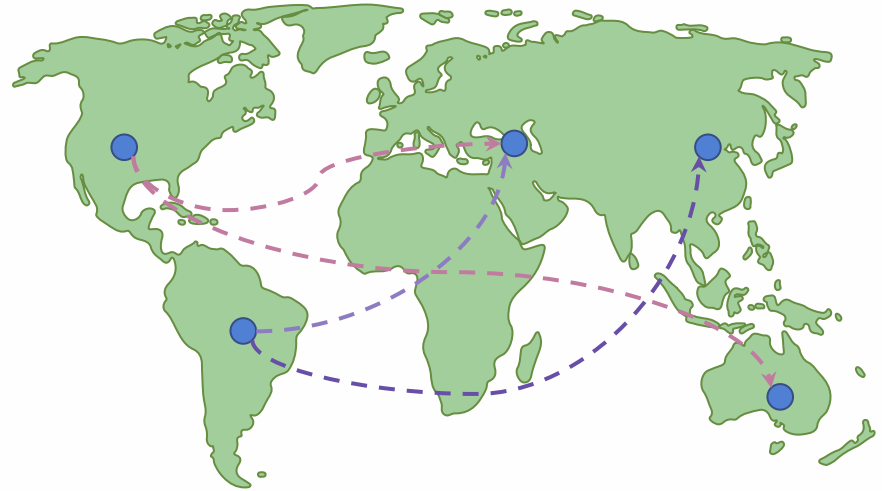
Decline of multilateralism

Limitations of multilateral actors

The problem's cause is beyond the local jurisdiction

The role of the State gains prominence in implementing responses aimed at environmental issues resulting from its commercial demand, through **trade regulation** - Non-Tariff Measures.

NTMs can be part of the **environmental governance solution for global trade**, if it is adopted by importing nations considering their **share of responsibility** for the **environmental impacts** generated in the country of origin and world.

To the extent that a country commits, through trade regulations, to **import products that are environmentally sustainable or whose production practices reduce environmental damage**, it assumes **responsibility for their demand** and does not just transfer the environmental burden to countries with more lenient environmental regulations.

Case study

NTMs related to SDG:

The dynamics of the fisheries sector can illustrate the socio-ecological impacts worsened by trade.

The existence of Multilateral Environment Agreements (MEAs) related to the protection of the marine ecosystem makes it easier to find NTMs linked to this environmental problem.

OBJECTIVE
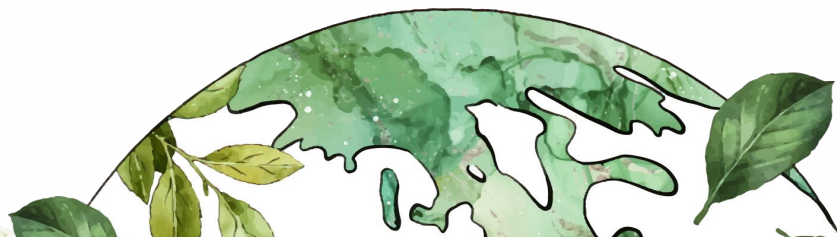
This study aims to investigate how NTMs are addressed in discussions on environmental governance of international trade.

Then to assess the impacts of NTMs linked to Sustainable Development Goal (SDG) 14 (Life Below Water) on fisheries trade.

METHOD

Method

1 **Map**
Map the NTMs related to SDG 14

2 **NTMs objectives**
Identification of keywords

3 **Model**
Gravity Model to identify the effect on trade

Step 1: MAP

SDG-HS-NTM concordance matrix (KRAVTCHENKO et al. 2019 and UNCTAD)

Identify product groups relevant to individual SDGs at 6-digit level of HS

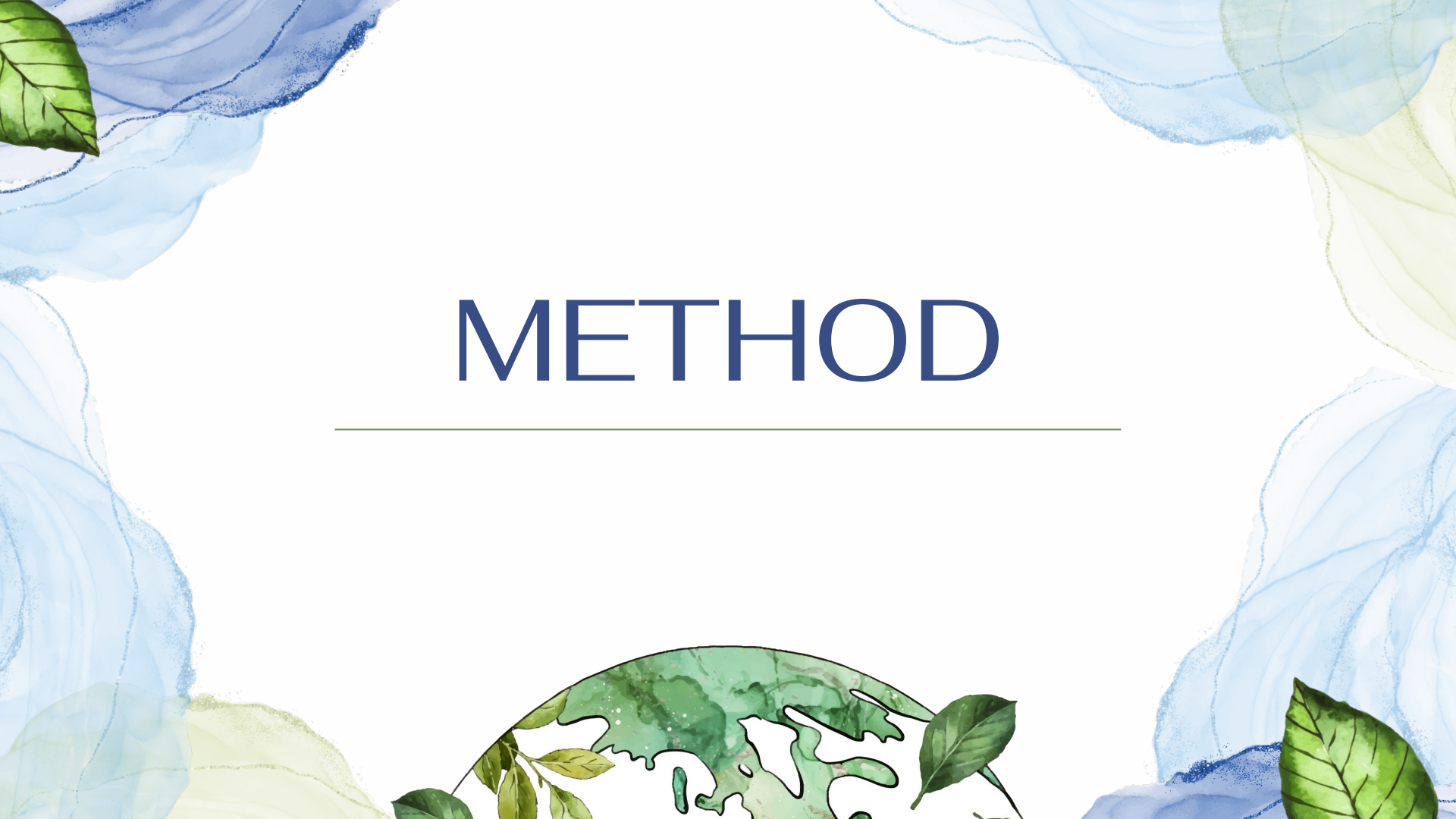What NTMs affecting trade in the examined product groups have public policy objectives embedded in SDGs

Use keywords to ensure higher accuracy of the results of the matching process

Use R software to evaluate each measurement against the criteria in the agreement entries.

A specific HS-NTM code pair was considered to have a **direct linkage to an SDG Target** if: (1) It has a **clearly stated SDG target** -related objective or (2) the examined NTM-HS code combination is not likely to **have any objective other than the one that is relevant to an SDG** .

Step 1: MAP

Table 1 - Keywords selected to represent links with SDG 14 and the NTMs that contain these keywords and affect fisheries products.

NTMs	SELECTED KEYWORDS
A11; A12; A14; A15; A19; A31; A32; A62; A63; A64; A69; A81; A83; A84; A85; A851; A86; A89; B14; B19; B31; B32; B41; B42; B81; B82; B83; B84; B85; B851; B853; B859; B89; B9; C1; C3; C4; C9; E1; E123; E129; E311; E32; E329; F61; F65; F69	iuu; illegal, unreported, and unregulated (iuu) fishing; illegal, unreported, and unregulated fishing; catch document; catch documentation scheme; illegal, unreported and unregulated fishing; iuu fishing; catch certificate; catch certification; catch certification scheme; CDS; **iuuf**; **legal origin**; **illegal trade**; **illegal fishing**; **permission of capture**; **legal sources trafficking**; **traceability system for fish**; **lawful fishing traceability** of all marine fishery; **fisheries activities that violate the law**; cites; (c.i.t.e.s); endangered species; endangered animal; endangered wild; wild life (preservation); lawfully exported; wildlife conservation; convention on international trade in endangered species of wild fauna and flora; convention on the conservation of species; protected species; endangered fauna; protection of wild life; wildlife under special protection; rare animal; wild animal conservation; protection of fauna and flora; wildlife requires; wildlife law; protected animal; protected wildlife; wildlife resources conservation and protection act; wildlife and plant conservation; wild life act; wildelife bill; threatened species; wild life protected; Protection of Aquatic Wild Animals

Step 2: Preliminary Model – Gravity Model

The gravity model was used to identify the effects of NTMs related to SDG 14 on the fishing sector. The gravity equation estimated in this study represented below has its variables described in **table 2 (next slide)** and followed the recommendations in **table 3 (next slide)** :

$$M_{ijkt} = c + \beta_0 fta_{ijt} + \sum_{n=1}^{N} \beta_n ntm(n)_{ij,t}^{k} + \gamma_{it} + \delta_{jt} + \eta_{ij} + \tau_k + \varepsilon_{ijkt}$$

Insert other variables: tariffs and valorem and intranational data.

Table 2 - Description of the variables .

Variable		Unit	Source
M_{ijkt}	Nominal value of imports of good k by country i from country j in year t. The subscripts i, j and k are respectively 58 importing countries, 53 exporters, 305 HS 6-digit products and t is the period between 2012 and 2021.	Current USD	UNCONTRADE - WITS
fta_{ijt}	Dummy takes value 1, if countries i and j have a free trade agreement; 0 otherwise.	Binary	Mario Larch
$ntm(n)_{ij,t}^{k}$	Dummy take the value 1 if importing country i imposes NTMs or grouping of NTMs by clusters of keywords related to SDG 14 on exporting country j for good k in year t; 0 otherwise.	Binary	UNCTAD - TRAINS
γ_{it} δ_{jt} τ_k η_{ij}	Importer-year (γ_{it}) and exporter-year (γ_{it}) fixed effects (FE), which control specific phenomena in each country and that vary over time; τ_k is the product FE and η_{ij} is the FE for the country pair, which controls for pair-specific phenomena that do not vary over time.	Econometric procedures	
ε_{ijkt}	Error term		

Table 3 - Description of the variables .

Recommendation	Motives
Use panel data with time intervals rather than consecutive years:	Cheng and Wall (2005) recommend using panel data with intervals, as allows the adjustment of trade flows to adjustments in trade policies or other changes in trade costs. According to Olivero and Yotov (2012), the most promising are the estimates obtained from intervals of 3 and 5 years.
Include directional time-varying (importer and exporter) fixed effects	The use of FE allows controlling for unobservable multilateral resistance and other observable or unobservable characteristics that vary over time for importing and exporting countries. Cheng and Wall (2005) and Shepherd (2013) reiterate FE capture the heterogeneity of countries and the effect of unobservable variables that are difficult to measure or that were not well specified in the model.
Include country pair fixed effects:	The inclusion of country pair fixed effects is relevant to correct the endogeneity between trade flows and certain explanatory variables, such as non-tariff measures (Yotov et al., 2016). They also capture the effects of traditional variables of the gravity model, such as bilateral distance, contiguity, colonial relationship, etc., which justifies not including these variables. Baier and Bergstrand (2007) recommend the use of country pair fixed effects to account for unobservable relationships between endogenous trade policy covariates and the error term in gravity equations. Furthermore, country pair fixed effects will account for other unobservable time-invariant trade cost components.
Use the Poisson Pseudo Maximum Likelihood (PPML) estimator	Santos Silva and Tenreyro (2006) recommend the use of this estimator which, in addition to dealing with null values, highlights outliers in the analysis, being considered to explain individual heterogeneity of each country. PPML supports binary variables and allows the inclusion of FE, resulting in consistent estimates in the presence of heteroscedasticity (Yotov et. al, 2016).
Use PPML-HDFE (High-Dimensional Fixed Effects)	According Correa et al. (2020) is a statistical method used to deal with a large number of categories or high-dimensional fixed effects. This combination allows you to efficiently control country-specific or country-pair fixed effects in gravity models, even when there are a large number of categories.

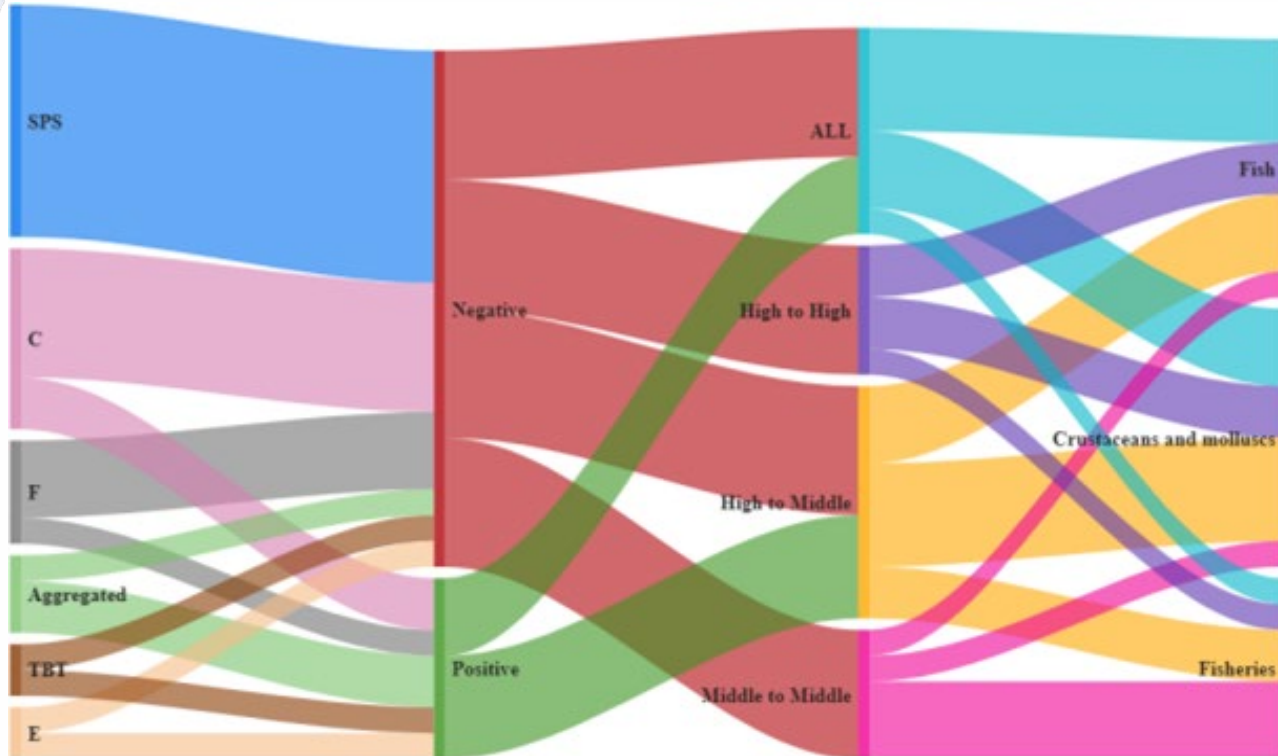Source: Own elaboration.

PRELIMINARY RESULTS

Preliminary Results

Figure 1: Estimation results for NTMs linked to SDG 14

Preliminary results corroborate the literature when the **effects of NTMs vary by type, sector and income level** (Disdier et al., 2008; Santeramo & Lamonaca , 2019, 2022). This means **the results may vary according to the sample and the NTMs** , suggesting the need to explore more specific subsamples.

Preliminary Results

Negative results may indicate that **NTMs associated to SDG 14 represent a challenge for trade**, regardless of the income level of the issuing country.

For the NTM to act as an instrument of environmental trade governance, exporting countries must obtain compliance with the NTM.

Otherwise, very strict environmental-related NTMs may cause trade to be diverted to importing countries with more lenient environmental regulations.

Next steps

Identify new NTM keywords related to MEAs related fisheries;

Cluster variables based on the environmental objectives of the NTMs;

Thank you!

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