

# It's Not (Just) the Tariffs

## Rethinking Non-Tariff Measures in a Fragmented Global Economy

*Daria Taglioni*  
*Hiau Looi KEE*



**WORLD BANK GROUP**

Development Economics  
Development Research Group  
October 2025



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## Abstract

As tariffs have declined, non-tariff measures (NTMs) have become central to trade policy, especially in high-income countries and regulated sectors like food and green technologies. Although NTMs may serve legitimate goals, they could also sort countries and firms into or out of markets based on compliance capacity and differences in product mix. Documenting recent advances in the estimation of ad valorem equivalents (AVEs), this paper uncovers new patterns of use and exposure of NTMs. High-income coun-

tries rely more heavily on NTMs relative to tariffs, while low- and middle-income countries face steeper AVEs on their exports. Firm-level evidence shows that NTMs disproportionately affect smaller firms, leading to market exit and concentration. Poorly designed NTMs can harm productivity and welfare, while coordinated, capacity-aware use can deliver inclusive outcomes. Policy design, transparency, and diagnostics must evolve to reflect the growing role—and risks—of NTMs in a fragmented global trade landscape.

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It's Not (Just) the Tariffs:  
Rethinking Non-Tariff Measures in a Fragmented Global Economy \*

Daria Taglioni<sup>†</sup>  
World Bank

Hiau Looi KEE<sup>‡</sup>  
World Bank

Authorized for distribution by Deon Filmer, Director, Development Research Group, Development Economics, World Bank Group

**Keywords:** tariffs, Non-tariff measures, trade policies, regulatory sorting.

**JEL Codes:** F13, F18

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\*We thank Deon Filmer, Lionel Fontagne, Indermit Gill, Bernard Hoekman, Somik V. Lall, Aaditya Mattoo for insightful comments and Daniel Lasso, for excellent research assistance in preparing the tables and figures. The authors gratefully acknowledge support provided by the World Bank Umbrella Facility for Trade, and its funding governments, as well as the Research Support Budget of the World Bank. The authors declare that they have no relevant or material financial interests that relate to the research described in this paper. The results and opinions presented in this paper do not represent the views of our institutions, the Executive Directors, or the countries they represent.

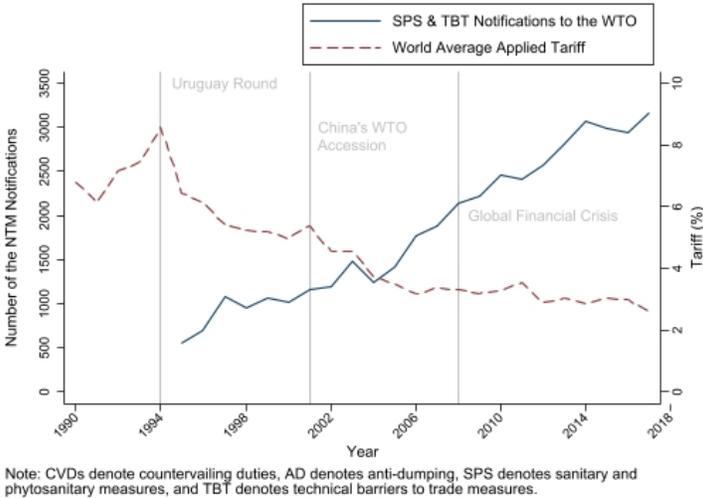
<sup>†</sup>Corresponding author. Development Research Group, The World Bank, 1818 H ST NW, Washington, DC 20433. Email: [dtaglioni@worldbank.org](mailto:dtaglioni@worldbank.org).

<sup>‡</sup>Development Research Group, The World Bank, 1818 H ST NW, Washington, DC 20433. Email: [hlkee@worldbank.org](mailto:hlkee@worldbank.org).

# 1 Introduction

Global trade tensions have returned to center stage, but the mechanisms of protection have evolved. Traditional tariffs have decreased significantly over the last three decades, in part due to multilateral and regional trade agreements. Instead, non-tariff measures (NTMs)—ranging from food safety rules and product standards, to licensing requirements, and even countervailing duties (CVDs) and export bans — have proliferated and emerged as the frontline tools in many trade confrontations. (Figure 1). Just like tariffs, NTMs could affect trade flows and prices. In addition, unlike tariffs, NTMs could be used to address social and global externalities, from protecting public health to addressing climate risks. But they also fragment markets in subtler ways, by sorting countries and firms into or out of global trade depending on their compliance capacity and product mix. This paper argues that NTMs now define the geography of market access at least as much as tariffs. Because many NTMs are technical, legal, or regulatory in nature, they have often escaped the spotlight. However, there is a rich literature demonstrating that their impact on trade flows, compliance costs, and market dynamics can rival or even exceed that of tariffs. This paper documents recent evidence on their restrictiveness, their disproportionate impact on developing countries and small firms, and the risks and opportunities they pose for global development. Understanding NTMs as both regulatory instruments and de facto trade barriers is central to any meaningful debate about fragmentation and the future of globalization.

Figure 1: **Tariffs vs NTMs, 1996-2022**  
 While tariffs declined steadily, the frequency of NTMs has surged.



Source: Authors’ calculation using data from Kee and Xie (2024) and Zavala et al. (2023)

## 2 Defining and Measuring NTMs

Non-tariff measures (NTMs) refer to “policy measures, other than ordinary customs tariffs, that can potentially have an economic effect on international trade in goods, changing quantities traded or prices or both” (UNCTAD, 2013, 2019).<sup>1</sup> They encompass a wide array of instruments, from sanitary and phytosanitary (SPS) requirements, technical barriers to trade (TBTs), and certification systems, to import licensing, quotas, price controls, and export bans. Many NTMs may serve legitimate domestic objectives—such as protecting food safety and public health, or addressing climate and security risks. They also shape trade flows and patterns, either positively (e.g. via increasing consumer confidence) or negatively (e.g. via increasing compliance costs), and alter market access, at times unintentionally excluding firms or countries.

Classifications of NTMs can be legal or functional. Legal typologies, such as the official UNCTAD framework classification (UNCTAD, 2013, 2019) distinguish three broad types of NTMs: technical import-related measures; non-technical import-related measures; and export-related measures. Technical import-related measures include sanitary and phytosanitary (SPS) measures—such as limits on pesticide residues in food or animal health requirements—and technical barriers to trade (TBT), such as labeling, safety, or environmental standards. Certification and pre-shipment inspections also fall under this category. Non-technical import-related measures cover import licensing, quotas and import restrictions, price controls, and contingent trade protection measures, as well as restrictions related to intellectual property, competition, and procurement policies.<sup>2</sup> Finally, export-related measures include export bans, taxes, licensing, and state trading requirements.

Beyond legal typologies, researchers also distinguish NTMs by their economic effects. These are functional typologies that emphasize economic impact and help with econometric implementation (Carrère & de Melo, 2011; Ferrantino, 2006). For example researchers often distinguish between *Border NTMs*, i.e. those affecting the clearance of goods and other provision regulating trading of products at the border, and *Behind-the-Border NTMs*, which involve certification requirements, standards compliance, and regulatory uncertainty. These

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<sup>1</sup>This official definition of Non-Tariff Measures (NTMs) comes from the Multi-Agency Support Team (MAST) on NTMs. The MAST group is composed of the following organizations: the Food and Agriculture Organization of the United Nations, International Trade Centre, Organization for Economic Cooperation and Development (OECD), UNCTAD, United Nations Industrial Development Organization, World Bank and WTO.

<sup>2</sup>Subsidies other than those affecting imports directly or exports are not considered NTMs since they are domestic support measures. However, their trade-distorting potential is recognized and dealt with under separate WTO rules - specifically in the Agreement on Subsidies and Countervailing Measures (SCM).

distinctions matter for quantifying the extent to which NTMs act as barriers to trade, since border NTMs resemble tariffs in their immediate effect, while behind-the-border NTMs tend to increase fixed costs and disproportionately affect smaller or less productive firms. They play a role of upstream frictions in undermining firm-level productivity and constraining trade responsiveness, a particularly relevant challenge in LMICs (Ederington & Ruta, 2016).

To compare NTMs with tariffs, researchers estimate their impact in ad valorem equivalent (AVE) terms—the tariff rate that would generate the same import-reducing effect as the NTM. The methodology introduced by Kee, Nicita, and Olarreaga (2009) standardized AVE estimations by applying gravity-based regressions to import quantity data—controlling for tariffs and incorporating import demand elasticities—to estimate the trade restrictiveness of NTMs across products and countries. The work resulted in the first globally comparable dataset of NTM AVEs, covering over 100 countries and thousands of products. These AVEs enable direct comparison of NTMs with tariffs, support the construction of trade restrictiveness indices—such as the Overall Trade Restrictiveness Index (OTRI) and the Market Access OTRI (MA-OTRI)—and allow the assessment of NTMs’ welfare costs (Kee & Nicita, 2022; Kee et al., 2009).

Taken together, the definitional and measurement framework highlights two key points: (i) NTMs, though legally diverse, can be consistently translated into a tariff-equivalent metric; and (ii) doing so reveals both their hidden restrictiveness and their asymmetric impact across countries, sectors, and firms. This sets the stage for the analysis of patterns and consequences in Section 3.

### 3 Patterns and Trends: Who Uses NTMs and Who Is Affected

Table 1 summarizes key global patterns in the use of NTMs compared to tariffs. It reports both simple and import-weighted averages of tariff rates and AVEs of NTMs, across a broad set of countries over 2018–2022. These restrictiveness measures, calculated using the methodology in Kee et al. (2009) and updated in Kee and Nicita (2022), allow for importer-exporter-product variation and support a comparison of what countries formally impose versus what they actually experience.<sup>3</sup> Taken together, these indicators illustrate how the

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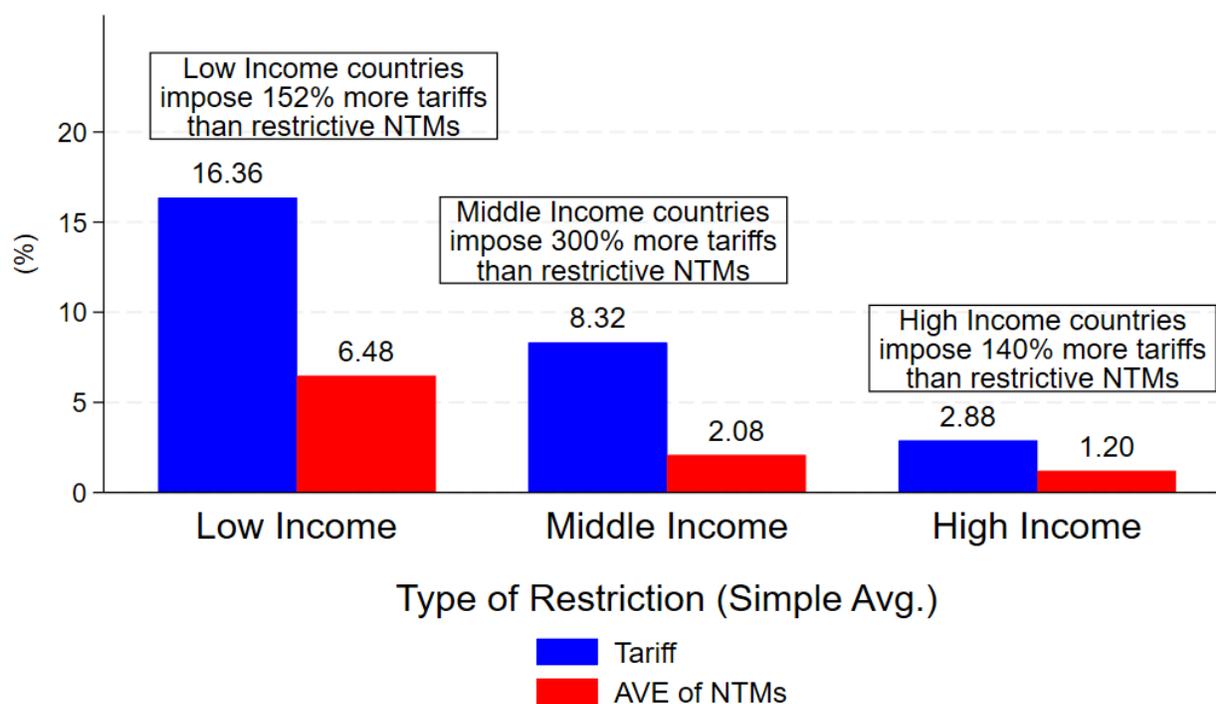
<sup>3</sup>Kee and Nicita (2022) estimates the AVEs for import-related border NTMs with bilateral variations across importing countries, exporting countries and HS 6-digit products, based on NTM data collected jointly by UNCTAD and the World Bank for years around 2018. These import-related border NTMs are A140, A150, A810, A830, A840, A850, A851, A852, A853, A859, A860, A890, B140, B150, B810, B830, B840, B850, B851, B852, B853, B859, B890, C000, C100, C200, C300, C400, C900, E100, E110, E111, E112, E113, E119, E120, E121, E122, E129, E611, F110, F120, F300, F310, F400, F500, F600, F610, F620, F630, F640, F650, F670, F700, F710, F720, F730, F790, F800.

global use of NTMs varies by income level, trade direction, and product mix—and how these patterns diverge from those observed for tariffs.

Until 2024, countries at different income levels used the mix of tariffs and NTMs differently.<sup>4</sup> Developing countries - and especially middle-income economies - relied far more on tariffs than NTMs, whereas high-income countries leaned more heavily on NTMs. These patterns are clearly visible in the cross-group averages shown in Figure 2: between 2018 and 2022, middle-income countries restricted imports through tariffs three times more than through NTMs, whereas high-income countries restricted their import through tariffs only 40% more than through NTMs.<sup>5</sup>

**Figure 2: NTMs vs Tariffs Restrictiveness, by Income Group**

High-income countries rely more on NTMs. Yet, both tariffs and NTMs remain higher in LMICs.



Source: Authors' calculation using data from Kee and Nicita (2022), estimates for 2018. Bars represent simple average restrictiveness across all countries in each income group.

These patterns are further confirmed by the country-level variation shown in Figure 3, which highlights both a correlation between reliance on NTMs and income group, and wide dispersion in NTM reliance within income groups. For example, among high-income countries, the

<sup>4</sup>This note does not cover the reversal observed in 2025, when the USA shifted towards higher tariffs.

<sup>5</sup>Low-income countries displayed a tariff-to-NTM mix that fell between that of high- and middle-income countries, but at higher overall levels of restrictiveness.

Table 1: Average Tariffs and Ad Valorem Equivalents (AVEs), by Country and Trading Partner (2021)

Country	To Imports from All Countries				To Imports from USA				Imposed by the USA			
	Simple		Import-Weighted		Simple		Import-Weighted		Simple		Import-Weighted	
	Tariff	AVE	Tariff	AVE	Tariff	AVE	Tariff	AVE	Tariff	AVE	Tariff	AVE
AFG	7.62	-	4.97	-	7.30	-	4.28	-	1.66	3.28	0.94	3.86
ARG	9.07	2.15	5.57	0.65	10.25	1.73	7.29	0.85	2.20	1.97	1.62	1.14
BOL	7.83	4.60	3.45	3.32	11.50	3.74	6.02	2.26	2.15	2.80	0.33	0.53
BRA	13.27	3.60	7.25	1.09	13.80	2.48	6.94	0.62	2.20	1.61	1.66	0.41
CHL	4.14	2.64	4.09	1.05	5.99	1.69	5.93	0.79	0.00	1.73	0.00	0.92
COL	6.63	4.48	5.96	1.71	8.32	3.54	6.13	1.58	0.10	1.57	0.18	0.27
CRI	4.62	2.72	2.34	1.16	2.31	2.10	1.92	0.65	0.06	1.82	0.17	0.93
ECU	7.14	3.49	4.49	1.48	9.67	2.87	3.72	0.83	2.16	2.02	0.45	0.15
EGY	12.26	-	10.64	-	16.25	-	5.51	-	2.15	2.35	5.49	1.95
EUN	1.62	1.32	1.37	1.11	4.28	0.96	1.98	1.66	3.45	1.29	1.64	1.84
GTM	3.91	5.55	2.30	2.00	1.12	3.87	1.39	1.32	0.06	1.75	0.50	1.41
IDN	4.46	3.52	2.41	0.71	6.68	2.78	3.23	0.49	2.16	1.93	3.73	1.23
IND	10.16	3.08	6.88	0.18	10.95	1.60	8.32	0.17	-	1.59	-	3.46
JPN	2.34	2.43	1.40	0.74	2.92	1.59	1.91	1.12	3.38	1.33	1.53	2.52
KAZ	5.90	2.42	3.35	1.11	7.27	2.05	4.01	1.08	2.16	3.26	0.68	0.12
KEN	12.76	-	6.24	-	13.00	-	6.69	-	1.11	3.07	0.07	3.94
KHM	11.88	-	8.51	-	16.31	-	23.30	-	1.66	3.15	7.17	1.32
LBN	8.91	-	4.56	-	12.21	-	3.71	-	2.15	2.63	1.08	0.10
LKA	8.43	3.99	4.26	2.61	8.77	3.22	5.58	2.56	2.15	2.79	7.89	4.74
MDG	12.63	-	5.44	-	15.94	-	8.27	-	1.10	3.65	0.04	3.84
MEX	6.26	1.87	1.58	0.28	0.00	1.05	0.00	0.30	0.16	1.38	0.09	0.70
MUS	1.72	-	0.71	-	1.84	-	0.82	-	1.11	3.39	0.59	3.10
NAM	6.96	-	1.33	-	10.94	-	10.36	-	1.11	3.61	0.00	0.02
NPL	14.58	-	10.65	-	15.06	-	10.41	-	1.64	3.41	1.15	2.50
PAK	14.16	2.16	9.88	0.37	13.88	1.32	8.65	0.04	2.16	2.47	8.44	1.84
PER	3.18	4.20	1.52	1.00	3.43	2.91	1.28	1.17	0.07	1.80	0.08	1.41
PRY	8.34	4.61	4.20	0.77	12.38	3.64	9.16	8.36	2.15	2.98	4.80	0.58
SEN	15.87	4.94	10.55	3.44	15.27	3.99	10.60	1.03	1.10	3.37	0.02	0.96
SLV	3.74	-	1.94	-	1.01	-	1.44	-	0.06	2.06	0.41	1.38
SYR	11.48	-	7.09	-	12.12	-	2.47	-	3.45	-	3.28	-
TUN	22.11	2.02	18.11	1.57	20.48	1.80	14.25	1.33	2.15	3.12	1.62	0.97
TZA	21.55	-	12.39	-	22.07	-	6.98	-	1.10	3.47	0.32	2.69
UGA	19.29	-	11.72	-	24.44	-	13.33	-	1.10	3.60	0.38	1.48
URY	8.80	3.45	3.93	0.51	11.75	2.72	4.34	0.33	3.45	2.55	4.93	0.95
USA	2.31	2.80	1.39	1.08	-	-	-	-	-	-	-	-

**Notes:** All numbers listed are in percentage term (%). This table reports both simple and import-weighted averages of tariffs and ad valorem equivalents (AVEs) averages of non-tariff measures (NTMs) for trade with all countries, and with the United States. The source of the analysis is [Kee and Nicita \(2022\)](#) and [Kee and Nicita \(2024\)](#). Averages are shown for imports from the world, from the United States, and for exports to the United States. Simple averages treat all products equally, regardless of trade volumes, and thus reflect the overall structure of tariffs and NTMs across all products in a country’s schedule. Import-weighted averages, in contrast, assign greater weight to products with larger import values. Because high tariffs or AVEs can suppress trade volumes—or eliminate trade altogether when prohibitive—import-weighted averages tend to be lower than simple averages by construction. The import-weighted AVEs faced by a country’s exports depend heavily on the composition of its trade. In general, tariffs remain higher than AVEs on average, but AVEs vary more by sector and regulatory intensity.

three largest economies illustrate the following variation: the EU applied the lowest average tariffs (1.62%) - and even lower NTMs (1.32%). Japan's tariffs (2.35%) and NTMs (2.43%) were nearly identical and higher on average than in the EU. Meanwhile the USA posted both higher tariffs and NTMs, with NTMs (2.8%) that exceeded tariffs (2.49%) by about 12%. Yet, as [Kee and Xie \(2024\)](#) show, these country averages can conceal substantial heterogeneity across products, sectors, partners, and firms, particularly in sensitive areas such as food and consumer goods.

Figure 3: **Country-Level Distribution of Tariff and NTM Restrictiveness**

Substantial heterogeneity exists within income groups, on the propensity to use tariffs vs. NTMs.



Source: Authors' calculation using data from [Kee and Nicita \(2022\)](#), estimates for 2018, simple averages of NTM AVEs and tariff restrictiveness.

These country-specific differences also map onto a broader divide between developed and developing economies before 2025. Developing countries not only imposed higher tariffs for their own imports, but also faced higher NTM-related barriers on their exports to high-income markets. Pakistan, for example, imposed an average tariff of 4.6% on its imports, and its exports to the United States faced an average NTM restrictiveness of 2.47%. By contrast, the United States applied a tariff of 2.49% on its own imports but its exports to Pakistan encountered a very low NTM restrictiveness (only 1.32%). This asymmetry underscores how the above cross-country differences can lead to situations where high-income countries enjoy more favorable bilateral access conditions than their lower-income partners.

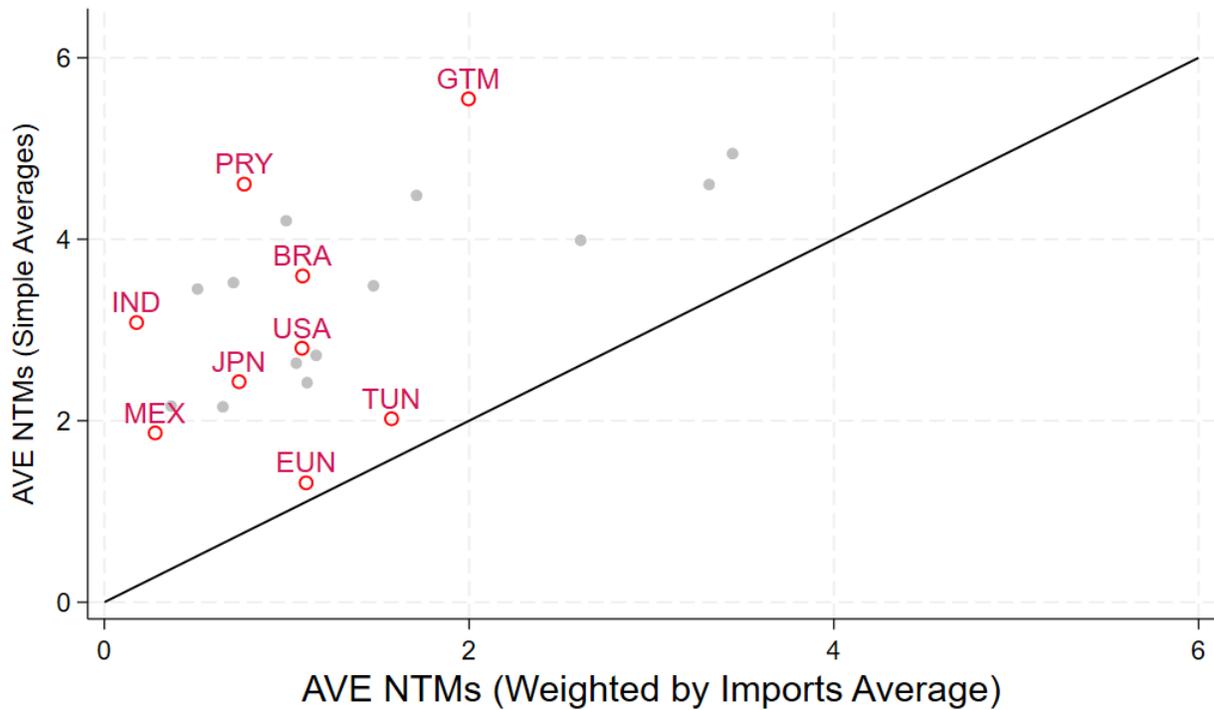
The uneven reliance on NTMs versus tariffs across countries can contribute to regulatory fragmentation. In particular, it may trigger a process of “regulatory sorting”— whereby countries and firms differentially sort into or out of specific markets depending on their ability - or inability - to comply with an importer’s complex and costly regulatory requirements. This sorting usually does not stem from explicit discrimination, but from the interaction between the design of NTMs - by its nature more opaque and burdensome than tariffs - and the capacity of trading partners, including their institutional infrastructure, specialization, and size of the trading firms. The India–USA relationship illustrates this dynamic well. On paper, the two markets look similar, with nearly identical unweighted AVEs (1.6% vs. 1.59%). In practice, however, Indian exporters face a much higher risk of exclusion from the highly regulated U.S. market than U.S. firms face in India. This is evident when looking at trade-weighted AVEs: Indian exports to the USA face an average restrictiveness of 3.49%, while U.S. exports to India face only 0.17%. These asymmetries reflect precisely the sorting mechanisms and dynamics

Trade-weighted AVEs are also important to explain the perceived restrictiveness of NTMs. This is sensitive to the different composition of imports and exports across countries. Again, a practical example shows the point best. The United States faces AVEs on its exports that are in line with those it imposes on its trade partners (e.g. simple-AVEs on EU-sourced USA imports are equal to 1.29%, while simple-AVEs for USA-sourced EU imports are equal to 0.96%). The perception of “unfairness” in the comparative restrictiveness the USA faces on the EU market stems from the different trade structure, i.e. respective composition of bilateral imports and exports between the two trading partners. The US trade structure is heavily concentrated in NTM-intensive exports—such as food and consumer goods—while its imports are primarily manufacturing goods, which tend to be subject to fewer NTMs globally. This nuance is captured precisely by differences between simple and import-weighted AVEs (Figure 4) and it explains why USA policymakers perceive bias, despite the non-targeted nature of NTMs it faces (Kee & Nicita, 2022).

The difference between imposed and perceived restrictiveness - quantified by the gap between simple and import-weighted AVEs - reveals another stark difference across income groups. For many low and middle income countries, import-weighted AVEs are lower overall than simple AVEs. Countries like Paraguay, Guatemala, and Peru show the largest gaps. For example, Paraguay’s simple AVE is 4.61%, but the import-weighted value is 0.77%. This 3.8 percentage points (p.p.) difference stands in stark contrast with the significantly smaller gaps in the EU (0.2 p.p.), Japan (1.7 p.p.) and USA (1.9 p.p.). These wide gaps in developing countries suggest that high NTM barriers may be suppressing trade altogether in the

Figure 4: **Simple vs Import-Weighted AVEs**

LMICs show larger differences, often due to suppressed imports in high-barrier sectors; high-income countries show the reverse.



Source: Authors' calculation using data from [Kee and Nicita \(2022\)](#). Weighted by imports average using UNCOMTRADE data. Estimates for 2018.

most regulated sectors—so little is imported that the weighted average appears low. This suppression effect is consistent with the hypothesis of “regulatory sorting”: firms in countries with weaker capacity are effectively excluded from NTM-intensive markets, leading to these countries’ trade becoming concentrated in less regulated products.

Beyond these static cross-country differences, an important dynamic is the gradual substitution of NTMs for tariffs in high-income countries. This shift reflects both structural factors and deliberate policy choices: as tariffs have fallen, NTMs have increasingly been used to preserve regulatory autonomy and to address social and environmental externalities. [Kee and Xie \(2024\)](#) show that substitution is more likely when the importer is capital- or skill-abundant (such as the EU, USA, or Japan) and the exporter is labor-abundant. They also find that deep trade agreements increase the probability of substitution, especially in food and consumer goods sectors—a result consistent with [Kee and Nicita \(2024\)](#), who show that variation in trade elasticities under deep agreements correlates with more frequent use of NTMs. Sectoral patterns reinforce this picture: according to [Kee and Xie \(2024\)](#), agricul-

ture, food, beverages, and other consumption goods are most often regulated through NTMs alone, while capital goods—particularly those embedded in global value chains—are more likely to face a combination of tariffs and NTMs. These dynamics help explain the layering of regulatory instruments observed in recent trade disputes, such as those involving electric vehicles between China, the EU, and the USA. Overall, the substitution of NTMs for tariffs underscores that fragmentation is not only about the level of restrictiveness but also about the instruments governments choose—choices that carry implications for transparency, fiscal revenues, enforcement, and the balance between openness and regulatory autonomy (see Table 2).

Table 2: Tariffs vs NTMs: Key Characteristics Compared

Aspect	Tariffs	NTMs
Transparency	Clear, published rates; easy to compare across countries	Often opaque; embedded in regulations; difficult to track or quantify
Predictability	Typically stable and rule-bound	Can be ambiguous, selectively enforced, or subject to sudden changes
Revenue Generation	Provide government income	Typically generate no revenue (unless fees or quotas are involved)
Multilateral Discipline	Bound under WTO or trade agreements	Technically difficult to simplify or harder to discipline; may violate WTO rules if protectionist intent is disguised
Administrative Simplicity	Easy to administer through customs	Require regulatory capacity (certification, inspections, etc.), often involving multiple agencies
Policy Flexibility	Limited to price-based protection	Can target non-economic objectives (health, safety, climate, etc.)
Market Impact	Pass-through depends on market powers of firms and countries	Higher compliance costs for small firms in developing countries
Welfare Impact	Terms of trade gains with price distortions	Terms of trade gains while addressing social externalities

Building on the empirical and theoretical insights above, NTMs reinforce fragmentation through four mechanisms. They foster North–North consolidation (advanced economies trading preferentially among themselves); prompt South–South reallocation (LMIC firms rerouting exports to less regulated partners); drive firm concentration and exit (through higher fixed compliance costs that exclude smaller exporters); and, finally, they create risks of policy misfires when poorly designed measures distort welfare and development outcomes. Specifically the mechanisms are as follows:

*North-North consolidation:* Advanced economies gravitate toward high-standard trade among themselves (Chen & Mattoo, 2008), while others not meeting shared norms become excluded (Disdier, Fontagné, & Mimouni, 2008). In particular, technical measures such as sanitary and phytosanitary (SPS) requirements in high-income countries have been associated with a shift in imports toward suppliers that can comply, while firms from lower-income countries are more likely to become excluded.

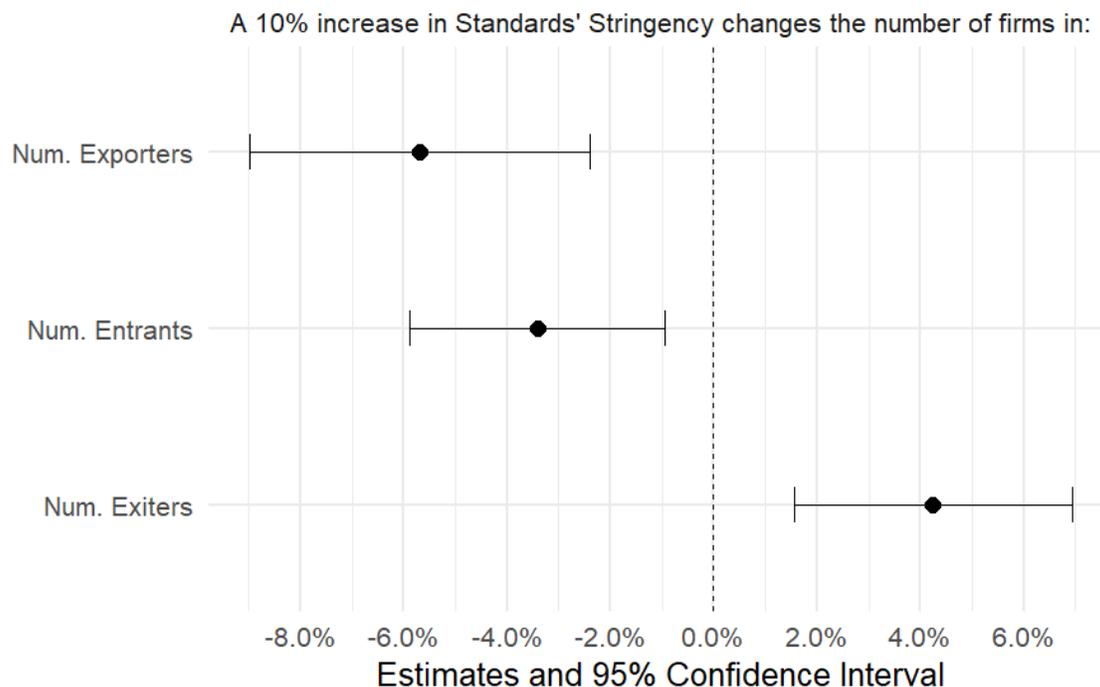
*South-South reallocation:* This dynamic is the counterpart to North-North consolidation. Namely, firms from LMICs tend to reroute trade to less-regulated partners, especially those outside deep trade agreements (Fontagné & Orefice, 2018). The OTRI and OTRI-MA data illustrate this fact too, showing that many developing countries face higher (import-weighted) non-tariff barriers exporting to high-income countries than to others. Several papers show that the rerouting is driven by high compliance costs and weak certification infrastructure according to several studies (Essaji, 2008; Maskus, Otsuki, & Wilson, 2005; Murina & Nicita, 2017; Zavala et al., 2023). These limit their ability to meet requirements in regulated markets.

*Firm concentration and exit:* NTMs discourage entry and increase exit for firms unable to meet compliance standards (Fernandes, Ferro, & Wilson, 2019; Fontagné, Orefice, Piermartini, & Rocha, 2015), leading to market concentration as smaller exporters are disproportionately affected. Fernandes et al. (2019) find that relatively more stringent standards in destination countries significantly depress exports at the extensive margin, i.e. a 10% increase in NTM AVEs reduce the number of exporters and new entrants by 5.6% and 3.4%, respectively, and increase the number of exiters by 4.2% (coefficients:  $-0.095$ ,  $-0.057$  and  $0.071$ , respectively). Meanwhile, they find no significant effect on the intensive margin, meaning that once firms are already exporting, these standards do not appear to affect how much they export (Figure 5). These results are consistent with trade models in which NTMs primarily increase fixed compliance costs - which only the most productive firms can overcome. Sanitary and phytosanitary (SPS) measures, already noted as a key driver of North-North consolidation, are also particularly effective at reducing the number of exporting firms and raising market concentration (Zavala et al., 2023).

*Risks of policy misfires:* Finally, NTMs have demonstrated to be powerful tools that can harm welfare when misused. In particular, NTMs can misfire when introduced without complementary reforms, institutional readiness, or careful design. Several country cases illustrate these risks. In **Indonesia**, a nickel export ban triggered the entry of low-productivity firms (Kee & Xie, 2025), while firms subject to NTMs on their inputs suffered significantly larger export losses following a currency realignment (Ruta, Calí, Caicedo Graciano, Ghose, &

Figure 5: **Regulatory Sorting Effect of NTMs**

NTMs fragment trade, marginalize low-capacity exporters, and distort firm-level incentives.



Source: Authors' calculation using estimates from [Fernandes et al. \(2019\)](#).

[Montfaucon, 2024](#)). In **Sri Lanka**, a temporary fertilizer import ban reduced rice yields by over 30%, with severe consequences for agricultural output and rural welfare ([Ghose, Fraga, & Fernandes, 2023](#)). In **Colombia**, non-automatic import licensing restricted trade with no clear benefits ([Kee & Forero, 2020](#)). By contrast, in **China**, low tariffs and permissive NTMs on upstream inputs enabled firms in the green energy sector to scale and add value—contributing to a surge in solar and wind exports ([Kee, Taglioni, & Xie, 2025](#)).

#### 4 Conclusions, Policy Directions, and Research Priorities

The evidence presented in this review of NTMs shows that while NTMs are essential to achieving legitimate non-economic goals, they are often implemented in ways that fragment trade, marginalize low-capacity exporters, and distort firm-level incentives. Their growing prevalence—and the disproportionate burdens they place on smaller firms and LMIC exporters—make them therefore central to today's debate on trade fragmentation. In an era of geopolitical rivalry and reconfiguring supply chains, NTMs increasingly determine who trades, with whom, and under what conditions. Their complexity, opacity, and uneven enforcement can fragment markets and deepen exclusion, but with the right institutions they

can also advance legitimate non-economic goals such as health, safety, and sustainability.

To ensure that NTMs support equitable trade outcomes rather than reinforcing fragmentation, countries need to pursue a coherent policy approach that addresses both capacity gaps and governance weaknesses. A first priority is to build quality infrastructure and certification systems in LMICs. Strengthening testing facilities, conformity assessment, and certification processes is essential to reduce exclusion from highly regulated markets, particularly by helping exporters meet SPS and TBT requirements and thereby improving compliance rates (Zavala et al., 2023). Equally important is the systematic integration of NTMs and their ad valorem equivalents (AVEs) into trade diagnostics and market access assessments. Incorporating NTMs alongside tariffs and harmonizing classifications would make it easier to identify the hidden restrictiveness that arises from trade composition differences across countries, while also shedding light on the “mix-and-match” strategies governments actually deploy (Kee & Forero, 2020; Kee & Xie, 2024). At the same time, governments must recognize that NTMs imposed in isolation, without complementary policies, often misfire. Analyses of Indonesia’s nickel export ban (Kee & Xie, 2025), Sri Lanka’s fertilizer import ban (Ghose et al., 2023), and Colombia’s reliance on non-automatic import licensing (Kee & Forero, 2020) all point to the risks of poorly designed restrictions, which can backfire and lead to welfare losses and governance challenges. Avoiding these pitfalls requires sequencing reforms according to institutional and sectoral capacity and embedding NTMs within a coherent development strategy. Finally, greater transparency and accountability are indispensable. Stronger WTO notifications, clearer provisions in regional and bilateral trade agreements, and more systematic monitoring can help reduce opacity and enhance predictability. Databases that track NTMs in tariff-equivalent terms, such as the [DAVE-NTM database](#), are particularly valuable in this regard. Enhanced notification, harmonization, and monitoring are all crucial to ensure that NTMs remain aligned with open trade objectives (Fernandes, Lefebvre, & Rocha, 2021).

Alongside these policy steps, additional research is needed to close critical knowledge gaps. Four research and data priorities are especially urgent. First, updating and refining AVE estimation annually is essential to track trade restrictiveness in real time and across sectors; while feasible, such global updates are costly and labor-intensive, requiring dedicated resources (Kee & Nicita, 2022; Kee et al., 2009). Second, deeper investigation is needed into the firm-level impacts of NTMs on global value chain (GVC) participation and market exit, particularly for SMEs in LMICs, which can be achieved by combining AVE data with firm-level customs and balance sheet information (Ghose et al., 2023; Kee & Xie, 2025). Third, analyzing NTM spillovers along domestic supply chains—especially in food, health,

and green technologies—offers valuable insights into how NTMs interact with critical sectors and how the mix of tariffs and NTMs can be optimized for development outcomes (Fernandes et al., 2019; Kee et al., 2025; Ruta et al., 2024; Zavala et al., 2023). Finally, there is a need to deepen political economy analysis of NTM proliferation, substitution with tariffs, and the trade-offs between regulatory autonomy and fragmentation, to understand the strategic versus cooperative deployment of NTMs (Ederington & Ruta, 2016; Kee & Xie, 2024). Understanding how NTMs reshape trade—and for whom—will be central to preserving openness, reducing exclusion, and advancing global development in the years ahead.

Taken together, these directions underline a simple but critical point: NTMs are now at the core of global trade governance. The challenge ahead is not to eliminate them, but to design and manage them in ways that preserve openness, reduce exclusion, and foster global development. Understanding how NTMs reshape trade—and for whom—will be central to achieving a more equitable and predictable trading system in the years to come.

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